COAL AGE

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Playgrounds for the Children

Mr. Coal-Mine Superintendent, do you realize the possibilities of the children's playground movement to your community or any other community for that matter, be it town, village or city?

THERE are men and women who believe that the establishment of playgrounds will revolutionize methods of education—men and women who have devoted their lives to educational work; and there are other men and women who go so far as to say that the movement should rank as our greatest contribution to the progress of the world. Be it known that the agitation has spread to the Philippine Islands and into Japan and is making rapid progress.

One teacher trained for playground work can take a public-school playground in any community and make it so popular among the children that every boy and girl of school age will clamor for enrollment. That is the first step in the program—the playground and the school are made to work hand in hand. Just as soon as interest has been aroused in the combined program, the child's educational progress is assured. It is no longer a case of all work and no play—in fact, it is almost all play to hear some of the children tell about it.

But what has the already overworked coal-mine superintendent got to do with all that? asks someone. Just at the moment nothing possibly, but if he expects to still be in harness when the present generation of school children reach maturity, he is the one most vitally concerned in the workings of the plan.

Boys love to group themselves into gangs (men do too, for that matter, only they call their gangs clans, cliques, lodges, etc.) and the playground gives the children the opportunity, under proper guidance, to advance beyond gang loyalty and root for their town. That is where the superintendent comes in. Think of an army of growing boys proud of their town.

And it is all accomplished so easily; this awakening of the town spirit. Perhaps it has its beginning in a baseball game between rival towns, or an athletic meet, or a vegetable-growing contest; the result is the same in any case. Once started, it takes hold with a vengeance and never releases its hold on the imagination of one who has caught the spirit.

If you think we are exaggerating, start an investigation. You won't have to go far to find one of these modern playgrounds—they are almost everywhere already. But don't start the investigation unless you are in shape to inaugurate a similar movement in your own camp, for you'll never be satisfied with your camp again if you do.

Ideas and Suggestions

Promotion of Employees

By E. L. Cole

Recently, when I was in the office of one of the executives of a large coal company, the constant changing of positions by technical men was mentioned as a serious company problem.

The officer said: "Every time I import a man at least two or three others leave my employ, giving as their reason that they were disappointed in not being advanced to the position, which I thought they were not qualified to fill."

The managers of our railroads have pioneered in many fields and have taught us many lessons; not the least of the good work that one of the progressive roads has accomplished is the means employed to maintain amicable relations with its employees, in spite of the closed shop that practically exists on this transportation system.

Whenever a vacancy occurs on the railroad in question, be it that of a mere brakeman or a conductorship on one of the most-coveted "runs," there is posted all over the division a notice to the effect that a vacancy exists and all who desired to be considered for the position are invited to file their applications, for which blanks that are practically "examination papers" are furnished by the superintendent. At the same time the latter is advised as to each applicant's character and ability by his immediate superior, and all things being equal, the man who is judged best qualified by his own answers to the questions propounded is promoted to the vacancy. One phase of this method of filling desirable positions is that anyone who in point of service is eligible to promotion, but for reasons of his own does not apply for the place, has no grounds to base any complaint for lack of advancement in the future.

The foregoing method has been tested for over a decade and by its use has given ample evidence of the wisdom of the officer who first instituted such a simple and admirable plan. It develops the esprit de corps among employees, it promotes the spirit of coöperation, it makes for all that is essential for the smooth operation of all industrial organizations. Furthermore, it gives to each employee, no matter how low in the industrial ladder he may be, a positive assurance that the future holds something tangible for him and that he has but to do his part and promotion will be his ultimate reward.

Why not borrow the plan for use in the coal industry?

Some companies leave all promotions in the hands of the foreman at the collieries, and in the engineering departments a similar plan is in vogue. As a result, we frequently see promotions made that are not in the best interests of the service—the result of poor judgment and lack of foresight on the part of those who make the promotions.

When a man is imported to fill a desirable berth (and right here it may be pertinent to remark that a position often regarded as of little importance by the management may be viewed by some of the employees as the goal of their desire), what a spirit of dissatisfaction is created! What personal enmity is aroused between employer and employee! The esprit de corps is now conspicuous by its absence. The men go about their work like inanimate beings. Their expressed opinion of the officers of the company is ofttimes unprintable. Moreover, they render disinterested service, and at the first opportunity leave the employ of a concern that had hoped to train them and keep them as permanent members of the organization.

Here is a plan that any company can try without cost or delay, and if put into effect it will never be discontinued. Employees will become more efficient once they are assured of promotion at every opportunity, provided they are qualified.

There is no other business that requires more brains, more personal initiative, more trained men than the coal-producing industry. And by reason of the complex problems that continually arise, it is desirable to maintain intact, as much as possible, the personnel not only of the engineering, but of all other departments of every mining company.

We hear among employers much talk of the lack of loyalty on the part of employees. Can we expect employees to be loyal unless we assure them that their meritorious services will be rewarded? Again I say, try the railroad's plan of promotion in the least desirable as well as the best paid positions in the organization.

Helping the Other Fellow

Mine owners want the earth and they want it hard. Mine managers want the earth and they want it hard. Mine superintendents and foremen want the earth and they want it hard. Yes, even the mine laborers want the earth and want it hard.

Has any man ever received all that he thought was coming to him?

It's easy enough to decide what we want.

But who ever stops to consider what the other man wants?

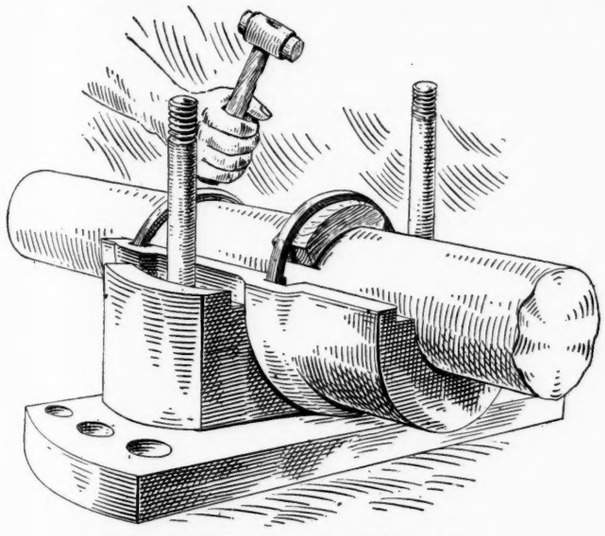
For example, mine owners do not realize that their mine laborers want the earth and want it hard—at least not until a sure enough syndicalist gets loose in their home town and stirs up the natives.

We might with equal truth say that foremen do not realize that laborers want the earth and want it hard, but the statement would not be impressive.

If every man would take a few minutes each day to say to the man just below him, "Friend, we're both trying to do the best we can, and while I haven't much time to help you along, I'll promise not to take advantage of you," there would be quite a different feeling in the world; and yet, strange as it may seem, most people could make that statement without stretching their consciences or drawing on their imaginations.

Truing up Oil Rings

It is sometimes found that an oil ring is a little out of round and fails to turn properly. The ring may have been damaged slightly in assembling the machine or jammed or struck subsequently. In some machines the oil rings can be easily removed, but in others, particularly in the intermediate bearing of a three-bearing machine,



HARDWOOD BLOCK UNDER RING

considerable work is required. A simple method is here suggested for truing a ring in place. By calipering one of the true oil rings, the correct inside diameter is obtained, and calipering the shaft at the bearing gives its diameter. Then by sawing out a hardwood form to fit the curvature of each and using as shown, the ring may be tapped with a copper hammer and revolved slowly and made true in a short time.—Gordon Fox in *Power*.

When Experience Fails To Teach

He prided himself on being an experienced man. You could hardly be with him an hour before you knew that, for he did not fail to make you acquainted with the fact. He had been around mines from his youth, and he knew just how they were run.

But he made no great success, for he depended on his experience and gave his imagination no place. He questioned nothing so long as it was done in the "good old way." He forgot altogether that it was the new way of working which could alone succeed.

He forgot that competing with him were thousands of managers doing work by the old and accepted rules and able, therefore, to produce coal at the same rate per ton at which he could produce it. He overlooked the fact that such men had to sell their coal practically at cost, or a little below.

The only man who could make money was one who could get his coal out cheaper. Experience alone, therefore, could never make him successful—it could only keep him in line. To the experience he had he must add imagination and a readiness to look at matters from a new point of view.

In fact, experience is as likely to be a trap as a cudgel. The man who relies on it alone never gets anywhere. If anyone would succeed, he must question every manner of operation from the ground up and must be convinced that there is something wrong or the operation would be more cheaply performed. The longer the life of a method the surer the practical man is convinced that it needs shaking up and reshaping.

And it's no use nibbling at the problem. The trouble with staple industries is that they are cursed by staple methods, staple men and staple machinery, and these staple follies can hardly be broken up except with a stick of dynamite.

The really enterprising man in '49 left the East and went West, and as a pioneer dared everything. The original men are similarly entering the untried industries, and the cautious men are left to conduct the older forms of activity on the tried lines of long experience.

Interesting Facts

Information of great practical value is contained in the articles on underground mining that are now being published in *Coal Age* each week. Our next issue will carry the first of the articles on "Western Mining Methods" by A. C. Watts, chief engineer of the Utah Fuel Co. No engineer in the country is better qualified to handle the subject than Mr. Watts. The East has much to learn from the West, especially in the matter of mining thick coal seams.

Lest We Forget

Most men who will read this are bosses in charge of men. Possibly you are a bank boss, a master mechanic, a general manager or a president.

What we are interested in is this: Do you realize fully that the men under you are human beings and not sticks of wood?

"Sure," you say—but wait a minute.

Do you make an effort to furnish these men a working place that is safe, well ventilated and well drained?

A human being appreciates all these things.

Do you take them into your confidence sufficiently to enable them to get a connected idea of what you are driving at?

A human being requires a vision.

Do you place trade papers at their disposal, having articles bearing on their particular kind of work?

A human being requires imagination.

Do you ever encourage their loyalty to you and to the corporation employing them?

A human being requires a hero.

Here's an illustration of what we are trying to bring out:

At Ellis Island off New York Harbor, where the immigrants are detained while their fitness is being investigated, it used to be customary to make sure that they were provided with food and shelter and stop at that.

Lately, under a new administration, it has been discovered that these men and women and children, who are often detained for indefinite periods, cannot put their senses to sleep, so the children have been provided with playgrounds, the mothers with flowers and the men with papers and magazines. The effect has been almost magical and holds a lesson for the coal industry.

Safety and Efficiency in Coal Mining

By Edward H. Coxe*

SYNOPSIS—Discipline is the foundation of safety. A concise, easily understood set of rules is valuable. A piece of apparatus should be repaired before it breaks. All dangerous places and machines should be guarded. Careful men should be placed in authority and should then be furnished the necessary material with which to work.

The first requisite for safety and efficiency is discipline. And by discipline I do not mean making rules and failing to enforce them, or enforcing them on some employees and not on others, or making others comply and breaking the rules yourself. I mean the enforcement of discipline from the top to the very bottom. If there is any one thing more than another that will tempt men to break and disregard rules, it is for the boss to do so.

By discipline I do not mean the adoption and enforcement of a lot of unnecessary regulations, many of which accomplish no other purpose than to be a burden on the employees and demonstrate that someone has or feels that he has authority to make rules. I do mean, however, the adoption of just as few rules as will insure the safe, economical and efficient operation of a mine and then the rigid enforcement of those rules on all alike without fear or favor.

Keep in mind that the fewer rules there are to remember the fewer there will be to forget and disregard. Keep in mind also that to be effective, rules must be known and understood by those who are to be guided and governed by them. There are many ways in which this can be accomplished. Among others I will mention having them printed on cards in large type and in all the different languages spoken by the employees and posted in conspicuous places around the plant and where men congregate. They should also be printed in neat pamphlet form and given to every employee as he is engaged.

All bosses and others in authority must know and understand the rules and assist the other employees to do so by talking with them from time to time on the subject. Hold examinations periodically, open to all employees, on the safety rules, and give prizes to those who pass the best examination. Have some person or persons give lectures from time to time on safety, illustrated by lantern slides, moving pictures or otherwise, showing the right and the wrong ways of doing things and illustrating or explaining the result of doing things the wrong way or the effect of breaking the rules.

Another way to impress the rules on the minds of the employees is to have a few of them printed each payday on the back of the pay statement or envelope or on a slip of paper to be inserted in each pay envelope.

Do It Now

I believe that after discipline, the next requisite is a careful observance of the two old adages, "A stitch in time saves nine" and "An ounce of prevention is worth a pound of cure." In other words, try to prevent breakdowns and accidents by frequent inspections and make the necessary renewals of worn parts before rather than after they fail. And when a dangerous condition is observed, attend to it at once; that is "Do It Now," and don't wait till someone is hurt or killed or some apparatus breaks down and causes a delay before repairing it.

Next in order of importance are cleanliness and ventilation, and by cleanliness I mean roadways and traveling roads free from mud, coal dust, slate piles along the sides of the tracks, and standing water over the rails. Good ventilation means a minimum of explosive or noxious gases, and a minimum of explosive gas means a minimum risk of gas explosions and resultant fires. A minimum of noxious gases means better health, and safety should apply to health as well as to life and limb. Better health means increased efficiency and less liability of accidents all around.

Good ventilation means not only plenty of fresh air, but that it should be properly conducted with a minimum of leakage to the working faces. Good ventilation also carries with it considerable of the moisture from the mine and means dry coal dust, which in turn implies danger of dust explosions unless measures are adopted to remove as much as possible of the dust and render the balance nonexplosive by moisture or mixture with rock dust.

Excessive ventilation with high-velocity air currents is a subject on which there is considerable difference of opinion among mining men. My own personal view is that when sufficient air is supplied to amply comply with the law, remove all explosive or noxious gases without allowing the return airways to carry a percentage of gas even approximating an explosive mixture or to be unduly loaded with noxious gases, remove quickly the smoke caused by shooting and provide a good, clear, sweet atmosphere for the men to breathe, it is then well to stop and call it enough. I consider this enough for several reasons: First, because the higher the velocity of the air current the more coal dust will be carried in suspension to be deposited along roadways, timbers and gobs to cause or increase possible dust explosions. Furthermore, more moisture is carried out of the mine, increasing the risk of dust explosions or requiring more humidification, or both. Second, because if more air is forced into the mine more power is consumed for that purpose, thus increasing the operating cost.

High air velocities will pick up dust from moving or standing cars and deposit it on timbers and gobs, especially if the coal is very dry. If the tracks are muddy or covered with water, it means that they cannot be kept in shape for economical and efficient haulage, and if the traveling roads or manways are in the same condition, the result will be that it will be hard to get the men to travel in them, or if they do, they will be compelled to work with wet feet, which are not conducive to health.

If slate, rock and dirt are allowed to accumulate along the sides of the tracks, they will be sure to accumulate in places to such an extent that they will slide down on the tracks, causing derailments, or be piled so close to the track that cars, and locomotives, if they are used, will scrape and rub, causing additional friction or damage

*Pittsburgh, Penn.

to equipment and sometimes delay in clearing the way so that trips can get by. Also, such accumulations make it impossible for a man to get in the clear if he meets a trip, or if he can get in the clear, he may slip on a piece of slate or pile of dirt in trying to do so and slide under or into the trip and be injured.

Then, too, the tracks should be kept in good condition, otherwise derailments and wrecks will result in possible injury or loss of life to the men, and always in delay in getting out coal and hence in inefficiency. Here again come in the two old adages already quoted. If a bad place in the track appears, repair it now and don't wait till it must be fixed in order to get a car over it or has probably caused trouble or injury. Furthermore, as a general proposition slovenliness invites waste in the use of material and supplies and promotes ill health, while cleanliness usually promotes economy and good health. Also, men working in clean surroundings will take more interest in keeping the equipment in their charge in proper working order.

Systematic Timbering Is Important

Another important factor in the safe and efficient operation of a mine is proper and systematic timbering. This requires, first, that suitable material be provided and, second, that it be properly and judiciously applied. Poor or insufficient timbering frequently causes delays in mining, loading and hauling coal, as well as injury or death to workmen and animals and damage to equipment as a result of falls of the roof.

The proper selection, handling and use of explosives has a marked influence on the safe and efficient operation of a mine. If the coal can be properly produced by a permissible explosive, passed as such by the United States Bureau of Mines, such an explosive should certainly be used. If not, then black powder of a suitable grade to produce the best quality of coal might be employed, but under no circumstances should dynamite be used, on account of the shattering and pulverizing effect it has on the coal, filling the air with a fine coal dust, making a hot flame and producing a poor grade of coal.

So much has recently appeared in the columns of *Coal Age* in regard to the safe handling and use of explosives in coal mines that I will not enter into the details of that, but simply say in passing that a clear and explicit set of rules governing this feature should be promulgated and enforced. The very strictest discipline is more necessary in this branch of coal mining than in any other with the possible exception of the handling of the ventilation and explosive gas in a gaseous mine.

Electric Equipment Should Be Properly Used

The use, or rather misuse, of electric equipment in mines has resulted in considerable loss of life and untold lack of efficiency. Some few years ago many mines were equipped with 500-volt direct current for haulage, cutting and pumping. This was especially true of old mines covering a large territory where transmission lines were long and where, in order to save excessive line losses or excessive use of copper in the transmission lines or both, this voltage was employed. But this class of equipment has been found to be dangerous and more costly to maintain, and its use should not be allowed in new installations. The limit for use on haulage or mining machines should be 250 to 275 volts. Anything above that should be confined to insulated wires and fixed equipment.

High-tension alternating current can be carried to or into the mines and transformed at substations which can be located at convenient places at the portal or within the mines, in conjunction, if desired, with pump stations or hoists. Electrical installations should be made under the supervision of a competent electrician or electrical engineer. Where 500-volt equipment is in use at existing operations, all trolley wires should be thoroughly shielded if less than 6½ or 7 ft. above the track, to prevent men coming in contact with them. All other wires should be thoroughly insulated and switches, cutoffs, jumpers, etc., housed in lock boxes. The greatest care should be exercised in handling cables for fear of defects from wear and tear on the insulation, which is of necessity subjected to very hard usage. Such cables should be subject to frequent and careful inspection on this account and should be well wrapped when conditions demand it.

Rubber mats or other efficient insulation should be provided in front of all switchboards. No matter what voltage is used, all wires should be substantially strung and supported and all equipment kept in good order and efficiently operated by competent persons in order to prevent delays from short-circuits, grounds and burnouts.

No other class of machinery around a mine is so subject to trouble on account of misuse as is the electrical equipment. Some years ago an old mine foreman of my acquaintance objected to the installation of some electric equipment in a mine of which he was in charge on the ground that if a steam or air engine got out of order any jack-leg could take a hammer and monkey wrench and maybe a wooden plug and "hit her a few licks and make her go," but if anything went wrong with an electric motor it took an expert to repair it.

All locomotives and cars should be kept in good order to prevent derailments, wrecks and delays, the former often resulting in injury to employees. Flat wheels and rough tracks, besides causing wrecks, shake coal off the cars in transit. Cracks in the bodies or boxes of the cars also allow small coal to leak out along the tracks. This means not only loss of coal, but additional work cleaning tracks as well as coal ground up into dust with the accompanying danger of increasing the magnitude of an explosion should there be one.

Gasoline Should Be Carefully Handled

Where gasoline is used in the mine for haulage, pumping or other purpose, the greatest care should be exercised in its handling and use. It should always be handled in a closed container free from leaks, and when necessary to transfer it from one container to another or to open any container, great care should be taken to see that no open light or fire of any description is near. The exhaust from a gasoline-driven engine of any kind should if possible be conducted into the return-air current and care taken to see that the air going to the working places is not contaminated with the fumes.

Care should also be exercised in the handling and use of lubricating oils or other combustible materials. The careless but too common practice of throwing oily waste or other combustible rubbish where it can cause a fire should be especially avoided. Spring-top metal cans should be provided as receptacles for such material.

Where stables are underground, hay should be carried to them in bales and not loose. Open lights should not

be allowed in stables, and a means should be provided for closing them air-tight quickly in case of fire originating therein. Fire extinguishers and water barrels and buckets should be kept close at hand. Open lights and smoking should be prohibited.

Permanent brattices and overcasts should be built of masonry. It is a wise precaution also to cover doors with some sort of thin sheet metal, especially if constructed of light soft wood. Old metal powder kegs can be used for this purpose.

All material of whatever character should be carefully watched to avoid large waste in that direction. Many a foreman, efficient in other directions, is particularly careless about not recovering track material and props from worked-out and abandoned places, believing that it is easier, if not cheaper, to take in new material than to recover what is already in the mine. His superintendent or manager, who is possibly hammering him to keep down his labor cost, will be more likely to notice promptly a slightly increased labor expense than a higher material or supply cost.

All machinery and dangerous places or conditions should be carefully guarded, shielded or cared for in some way to minimize the liability of injury to employees. Separate manways should be provided where mechanical haulage is in use and the men should be compelled to travel by them. Especially should men be forbidden to travel on slopes while trips are being operated thereon. A drag or some other automatic stop or derailing device should be attached to the rear end of loaded trips while moving up a slope to prevent them running back in case of a broken rope or coupling. Men working in slopes should be protected by a derail switch or barrier of some kind against runaway cars.

Where a separate manway is impossible, a clear space alongside of the track should be maintained for foot travel or at least manholes along the rib at frequent intervals. These should be kept whitewashed so as to quickly attract the eye. All locomotives should be equipped with good headlights, and when necessary to push trips (which should not be done if it can be avoided) the front end should carry a light or automatic gong or both.

Careful Preliminary Study Is Essential

A careful study of the nature of the coal and superincumbent strata should be made to determine whether the longwall or room-and-pillar system of mining should be carried on. If the latter is adopted the proper percentage of extraction on the first mining should be determined as well as the maximum width of entries and rooms that can safely be used with a minimum of timbering and roof trouble, the minimum safe thickness of pillars to be left so as to avoid danger of a squeeze or creep either before or during robbing and still keep narrow work and yardage down to a minimum and get a maximum tonnage with a safe minimum amount of development.

In all cases, however, it is well to keep on the safe side. In room-and-pillar work generally, and especially if a large regular area is to be worked, a panel system of some sort should be used. The size of the panel and length of entries and rooms to be adopted should be carefully studied so as to avoid excessive gathering hauls and an excessive amount of roadways which must be maintained regardless of the output secured.

Another matter requiring careful study and on which there is some difference of opinion is when to draw pillars. My opinion is that if conditions will permit, the pillars should be drawn as soon as places are driven to their limit, as I believe that at that time, if the pillars are sufficiently large, they can be drawn cheaper and easier and will yield a better grade of coal with less waste than later.

However, if the superincumbent strata carry large quantities of water which is admitted to the mine by the drawing of the pillars and consequent breaking of those strata, the amount of water resulting therefrom to be pumped may be so excessive that it might be much cheaper in the end to leave all the pillars till the first mining is completely finished or nearly so and confine the excessive pumping cost to the final robbing period instead of spreading it over the whole life of the mine. In some cases title to the coal will not permit damage to surface land where it is valuable, and in such cases a minimum safe pillar should be left during the entire period of the first mining.

Location and Kind of Room Tracks Is Important

In connection with the layout of the mine another question to be considered is the location and kind of room tracks and whether one or two should be employed to the room. The number and location will depend on the width of the rooms and pillars, nature of the roof, whether the seam is flat or pitching and the method of getting cars in and out of the rooms, and whether or not the pillars are to be drawn at once. In regard to the kind of track to be used in the rooms, it will be found to be cheaper in the long run and more efficient, though more expensive at the start, to use steel rails, except where rooms are driven up the pitch and a single track used, the loaded cars being let down by hand with brake or sprag, in which case it will be found easier to control the loads on wooden rails.

Steel ties in the rooms will also be found economical in the long run if properly used and cared for. Especially are they recommended in low coal, thereby allowing the use of a slightly higher car or giving more room between the top of car and roof for loading and possibly preventing the necessity of brushing the roof in some or all rooms.

The type of mining machine, from among the many different kinds now on the market, to be chosen as best suited to meet each condition is a question that should be given careful and thorough study, as on the selection of the best adapted style of machine may depend a large measure of the success of the mine.

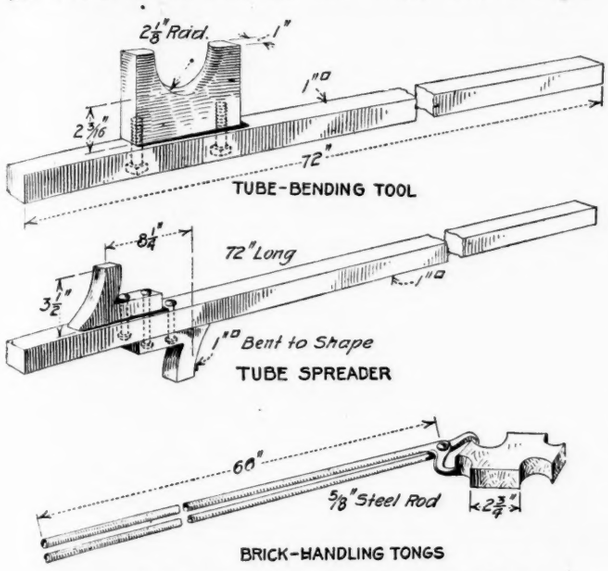
Careful and thorough inspection of the working places, especially in mines generating gas or having treacherous roof, is essential also to safety and efficiency.

Efficient Men Are Necessary

Finally, a most important factor in the safe and efficient operation of a coal mine is the selection of the most careful and efficient men available for the different posts to be filled, from the superintendent all the way down the line. When such men are selected, confidence should be placed in them, especially those higher up. They should be given what they need—not extravagantly, but enough to work with. Then and then only can results be expected.

Tools for a Water-Tube Boiler

A lighting station used a battery of four 300-hp. Babcock & Wilcox boilers, and in the care and upkeep of these the need of several tools was felt. These were to be purchased in the market, but the engineer decided to have a set made at a near-by forging shop and have them of a size that was suited to these particular boilers, says D. A. Hampson in *Power*.



BAFFLING TOOLS FOR THE BOILER ROOM

The drawings show these tools and need little explanation. The tube-bending and spreading tools are made of steel and are long enough to reach up in among the tubes. The brick-placing tongs are most convenient for setting the new baffle bricks in their hard-to-reach location.

Duty of Employer to Employee*

The employer should fairly remunerate the workman for all that is expected of him.

We hear a great deal about inequality in the matter of wages. One man earns a great deal more than another who serves longer hours and does more work. This evident cause of dissatisfaction has a bad moral effect on other workers; it disheartens the poor unfortunate who, though he does his best, finds himself behind, and it assists the less assiduous ones to deliberately shirk their duties.

In paying his workers the motto of every employer should be "Equal work, equal wages." The worker should be supplied with the best possible appliances and given every opportunity for being trained in their use. The conditions of work, while not so harsh and cumbrous as to cause unnecessary inconvenience to the worker or interfere with the proper performance of his duties, should yet be stringent enough to prevent the possibility of any circumstances likely to cause injury to health, life or limb.

For example, badly ventilated mines, workshops, offices and schools should not be tolerated, and unsafe appliances, cages, ropes, ladders, scaffolding, etc., should have no place in the equipment of a mine. The whole operation should be governed by regulations that must be strictly observed and are generally conducive to the safety and good health of the workers. The employer should do all that lies in his power to raise the status of his workers, socially, morally and intellectually. This can be accomplished as follows:

Socially—By providing better houses and creating opportunities for sufficient and suitable recreation when employees can meet their fellow workers under the varied circumstances of life. It is true of human nature that the oftener men meet one another, the better they understand and know one another, and the more likely it is that "peace and good will to all men" will reign upon the earth.

Morally—By encouraging habits of cleanliness, punctuality, sobriety and thrift among the men.

Intellectually—By helping to establish schools, scientific and literary classes, libraries and similar institutions, and affording facilities for the attendance of workers at such places, and encouraging the same by giving due preference and recognition to those whose aims and attainments are the most meritorious.

Now, more than ever, must the result of the world's commercial struggle depend on that most valuable of all national assets, brains, and coupled with it must be the personal aptitude of every unit making up the commercial whole.

When the management of a mine is intrusted to an intermediary between employer and workers, it is due to the workers that the choice of such a person should depend not upon private influence or social standing, but solely upon merit, having special regard to the experience, age, attainments, moral character and fitness of such person for the particular work required of him.

The element of trust should play a large part in the relations between an employer and his men. Trust inspires confidence, and the latter is always productive of better work, which is after all the very thing the employer wants. When the employer comes into closer relations with his employees, there is awakened a spirit of mutual helpfulness, which takes the place of that too widely prevailing today—a spirit that too often partakes of open hostility or exclusive self-interest. Labor and capital are the two oars of a boat, and both must work in harmony before any progress can be made.

The *best* solution to this subject is that offered by the Gospel. Let love take the place of selfishness and the Golden Rule become the basis of every contract between the employer and his workmen. The result will be to create a sense of responsibility in the employer and personal loyalty in the employee.

*This article was awarded the prize offered by a prominent mine superintendent in the anthracite region of Pennsylvania at a literary contest among the mine employees.

Superintendence of Mine Villages—The sanitary engineer of the United States Bureau of Mines, J. H. White, recently declared to the National Safety Council: "The time is coming when town and mine management will be separated. The management of a modern mining town can no longer be considered as a mere side issue of the mine superintendent's duties. One cannot proceed far in any constructive mine-town program before he sees that the mine superintendent cannot run both the mine and the town without doing an injustice to them both and to himself also. Already some mining men are decrying the fact that mine superintendents are spending too much time on the surface and in the office and are shifting the more disagreeable but vitally important underground duties into the hands of subordinates, who are often but ill fitted to perform them."

Track Layout at Mine Tipples

By E. A. Holbrook*

SYNOPSIS—The arrangement of tracks, and particularly the grades in the yards at coal mines, are subject to many variables. The grades that are theoretically correct coincide closely with those usually employed.

Mine-tipple designs differ greatly in the layout of the railroad tracks—that is, in the location and grades of those tracks used for the empty, loading and loaded railroad coal cars. At many mines the uneven and uncertain grade of the railroad tracks and switches is a noticeable fault and one that causes trouble and delay, on account of the frequent stopping of cars or the derailment of runaways.

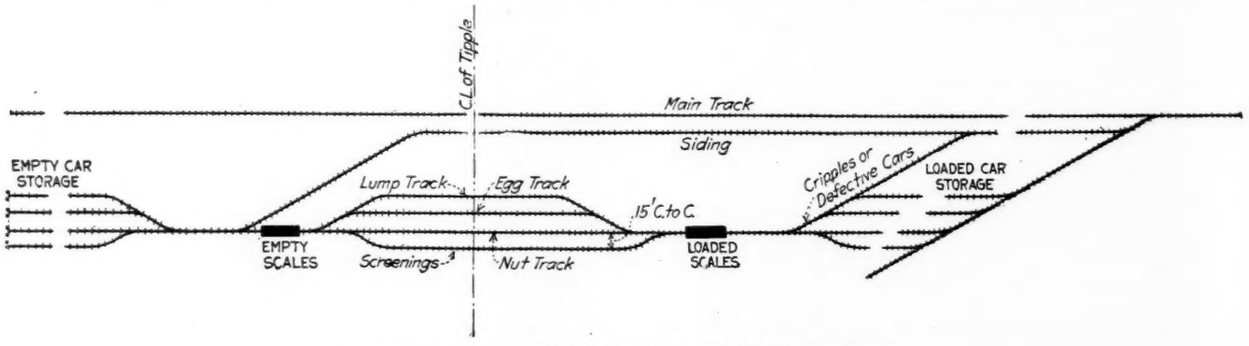
The decision as to the best location and grades for the tracks may be complicated by the following factors: (a) Contour of the ground, (b) grade of the location line, (c) necessary position of tracks with reference to the mine tipple, (d) difficulty of obtaining railroad cars when needed, (e) variation in weather conditions to be expected, (f) differences in frictional resistance of different cars, and (g) difference in frictional resistance of the same car when empty and when loaded. These variables do not permit of a definite and universal solution of the problem, but a discussion of them may indicate the best practical solution. It will also show that small differences in grades are important and that keeping grades, tracks and roadbed about a mine tipple in perfect condition is a paying investment through the saving of time and trouble.

The accompanying drawing illustrates an ideal layout for the mine-tipple railroad tracks and necessary yards. The train of empties is run from the main track and spotted in the empty-storage yard. The long siding track shown is not a necessity, but it allows extra car-storage capacity and entails only one switch on the main-line track. By having the siding track in the position indicated, the engine does not have to pass over the empty-track scale. Provision is made at a few mines to take the locomotive over the track scales on special dead rails, but the position here indicated is preferable, especially from the standpoint of simplicity.

In some empty-storage yards the tracks lead from one side of a ladder track, in others they converge symmetrically to a central track, while in still others a double cross-over or scissors arrangement of connecting tracks, is used. In the layout illustrated, one of the middle tracks is carried in a straight line from one end of the yard to the other, and the other tracks converge from each side into it by means of ladder tracks arranged symmetrically. Independently of the number of tracks used, this gives the simplest arrangement possible under the conditions usually found at mine tipples and is the one with the least amount of curvature.

The length and number of the empty-storage tracks is important. The average condition relating to the frequency with which the railroad companies can spot empty cars probably requires a total length of empty-storage track capable of holding one day's supply of empties and an equal length of track below the tipple for the storage of the loaded cars. For example, for a mine producing 2,000 tons per day there is required the following storage space: Each car requires approximately 40 ft. of track. Using 50-ton cars, 40 cars per day are required or a total length of empty-storage track of 1,600 ft.

The number of empty-storage tracks is generally from two to five. Before the tracks are laid, a considerable fill is frequently necessary in order to obtain the necessary grade. A greater number of short tracks, say four or five, require a less total quantity of fill than when only two tracks are used, since with the two tracks the yard is longer and the necessary elevation higher. When using four or five tracks, the average car is nearer the tipple and is under better control.



PLAN OF IDEAL RAILWAY-TRACK ARRANGEMENT

When an empty car is needed at the tipple, it is run over the empty-track scale situated in the position shown and the correct tare taken. The real tare of a railroad car often varies several hundred pounds from that stenciled upon it, especially if several months have elapsed since the car was marked. Consequently it pays to weigh each empty car. A few years ago many track scales were placed underneath the mine tipple, with an individual scale for each track, where they were under the control of the tipple weighman. The obvious difficulties in keeping these scales clean and the jarring and damage to them from the loading and frequent shifting of the cars at this point have resulted in the empty- and loaded-track scales being placed some distance away from the tipple, even though this may require extra labor for weighing.

After passing the empty-track scales, the car can be switched to any one of the tipple tracks as required. Usu-

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ally the cars are inspected and cleaned in the empty-storage yard in advance of being needed. They are then run down and stopped on the correct track 50 or 100 ft. above the tipple where they are handy when wanted. After being started from this point, the empty car gently bumps the loaded one under the tipple, causing it to start and following it closely until the empty one is in a position where the stream of coal falls into it. In this way the cars are shifted without interfering with the flow of coal over the screens and without spilling the coal on the tracks. After loading, the cars pass over the loaded-track scales as shown and into the loaded, or assembly, yard from which they are billed to their destination and taken away in trains.

Provision should be made in such a yard for taking a damaged or unfit car out of the system. In the arrangement shown a defective car, if detected in the empty-storage yard, may be set out before reaching the empty-track scale, or if not discovered until the tipple is reached or until loaded, it may pass over the loaded-track scales and be set out on the side track below without going into the assembly yard.

If a greater number of tracks than shown is required at any point, the design may be changed easily by keeping one of the inside tracks as the straight or main yard track and adding the extra tracks according to the double-ladder arrangement indicated.

Correct Grades Are Important

The question is often asked, Is it possible to design tipple tracks with such a grade or series of grades that cars will be under easy control at all times, yet be movable with a minimum of trouble? Different cars vary widely in their resistance to movement, and the same car differs in this resistance by a change in any of the following factors: (a) Condition of track and roadbed, (b) curvature of tracks, (c) number and position of frogs and switches passed over, (d) temperature, (e) moisture on rails, (f) wind, (g) velocity of the car, (h) weight of car and load, and from other but minor details.

It is not possible, therefore, that a standard grade can be determined that will suit perfectly all these conditions. One solution is to design the grade for the average condition, hoping in this way to move the maximum number of cars with the least effort. Another solution is to design with reference to the cars offering the greatest resistance, in this way being able to move easily every car, and to depend on braking to keep the cars offering the least resistance under control.

In general, the practice followed has been limited by the following conditions:

1. Where the contour of the yard will permit grades not exceeding 1 per cent. In this case the cars, both empty and loaded, generally must be started by some mechanical device and are often controlled entirely by it. The device is usually a steel rope leading to a small winding drum or engine and called a car puller, or haul. At small mines animal power or manual labor is often used, aided by pinch bars or car movers.

2. Where the grades are steep enough to allow the average car to start and leave the empty-storage yard when the brakes are released, and to be kept under control while under the tipple by sprags and the hand brakes. After loading, the car is started and takes its place in the loaded-storage yards with more or less attention from the yardman or car rider. Under these conditions certain cars have to be assisted in starting and at times aided in keeping in motion.

3. Where the grades may be made steep enough to allow the cars to start themselves under any conditions on release of the brakes, and to require control by a car retarder or similar device while being loaded under the tipple.

The theoretically perfect condition approaches case 2. Under perfect conditions the cars should start and run out of the empty-storage yards slowly and surely on release of the brakes, attaining a maximum speed not to exceed 3 mi. per hr. They should pass slowly over the empty scales and be stopped easily about 50 to 100 ft. above the tipple. At this point they again should start on release of the brakes and stop at the tipple with the forward end just under the loading chute or boom.

During loading it should be possible to have the car move forward only a few inches at a time, that the coal being loaded may always strike that already in the car near the top of the pile, and roll down the slope with a minimum of degradation. The full car should, on release of the brakes, run slowly over the switches on the ladder tracks to the loaded-car scales on the central track, then decrease its speed until it bumps without excessive jar the car that has preceded it into the yard. How nearly can these desirable conditions be fulfilled?

The following table gives the tipple-track grades recommended by previous writers, together with personal notes of my own:

TRACK GRADES AT VARIOUS MINES

Authority	Grades Above Tipple, Per Cent.	Grades at Tipple, Per Cent.	Grades Below Tipple, Per Cent.	Remarks
"Coll. Eng.," Vol. 18, 1897-98, p. 347	1.50 to 1.25	.....	1.2 to 0.9	Claimed that pinch bars will not have to be used to start the cars
"Coll. Eng.," Vol. 22, 1901-02, p. 292	1.25 to 1.00	2.0 for 50 ft.	1.25 to 1.0	Enables loaded cars to start easily
"Coll. Eng.," Vol. 28, 1907-08, p. 97	1.50	.....	1.0	At an Illinois mine
"Coll. Eng.," Vol. 31, 1910-11, p. 646	1.60	2.0 for 50 ft. above and below the tipple	1.50 to 1.25	At a Pennsylvania mine
"Blk. Dia.," Aug. 3, 1912, p. 23	1.50 but sharper at upper end	.....	1.00	Velocity of cars 3 mi. per hr. Average grade 1.25% for whole yard
Writer's notes	1 ft. in 80, or 1.25 per cent.	1.25	1.25	At an English mine
Writer's notes	1.50, would prefer 2.0	1.50	1.25, would prefer 1.50	Data given by a mining engineer at a large Illinois mine
Writer's notes	1.0	1.0	1.0	Car puller used
Writer's notes	1.0	2.0 for 50 ft. above and below c. of tipple	1.0	At an Indiana mine
Writer's notes	2.0 to 1.0	1.5 to 3.0, 2.5 preferred	1.0 to 0	Car retarder used

Many of these yards undoubtedly have been designed by copying successful experience elsewhere. An idea of the proper grade may also be obtained by considering that the force of gravity acting by reason of a certain grade overcomes car resistance and causes a tendency toward motion.

The force exerted on any car by reason of the grade may be expressed by the formula,

$$F = 20 \times g \times W_t$$

where

F = Total force in pounds exerted by the car tending to move itself down the grade, or that which it would be necessary to apply to overcome the grade, or the total grade resistance;

g = Track grade, expressed in per cent.;

W_t = Weight in tons of car and load.

For the car to start F must be greater than the starting resistance of the car. For the car to continue in motion F must be greater than the moving or rolling car resistance. For the car to come to a stop F must be less than the moving or rolling car resistance. If values for F can be substituted in the formula $F = 20 \times g \times W_t$, corresponding values for g may be computed easily.

Although values for train resistance have been found, until recently but little data were available concerning resistances offered to motion by individual cars. In a paper lately published by the American Railway Engineering Association[1], C. L. Eddy details tests made to determine rolling car resistance under actual yard conditions. This gross resistance is the sum of the individual resistances caused by (1) journal friction, (2) rolling friction, (3) oscillation and concussion, and (4) resistance of atmosphere.

As has been noticed often in moving cars in mine-tipple yards, he finds this total resistance is greater in cold weather, greater with low speeds (0.5 mi. per hr.), that it varies decidedly with the condition of the track, and is less per ton for heavy or loaded cars. Moreover, there is a great difference among different cars, some offering a resistance as great as 33 lb. per ton and others as little as 12 lb. per ton; 30 lb. per ton taken as a maximum resistance covers 90 per cent. of all the empty cars tested, while the average resistance for all empty cars tested was about 22 lb. per ton. From the formula given, the grades necessary to keep these cars moving with uniform velocity are:

Where $R = 33$ lb., $g = \frac{33}{20} = 1.65$ per cent. grade
Where $R = 12$ lb., $g = \frac{12}{20} = 0.60$ per cent. grade
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Evidently a yard built for the average case ($R = 22$ lb.) will need a car puller for the worst case ($R = 33$ lb.), or if built steep enough for the worst case, may require careful braking for the car with lowest resistance ($R = 12$ lb.), especially if the tracks are wet or slippery.

The resistances just considered are rolling resistances for empty cars, which generally weigh 15 to 20 tons. The starting resistance of a car is a different and larger factor than the rolling resistance. No data are available on this point, but the starting resistance has been taken frequently as 1½ to 2 times the rolling resistance for the average condition. The individual starting resistances depend on temperature conditions of the bearings and of the tracks and on whether the start is made after a long or short stop. From the assumption for the average case, the starting resistance of the average empty car would be $1\frac{3}{4} \times 22 = 20 \times g$, or $g = 1.925$ per cent. grade. The average loaded car, according to Mr. Eddy, has a rolling resistance of perhaps 17 lb. per ton. As before, $17 = 20 \times g$, or $g = 0.85$ per cent., which is the grade on which the loaded car should continue to run with uniform velocity. Also to start this loaded car $1\frac{3}{4} \times 17 = 20 \times g$, or $g = 1.49$ per cent., which is the grade necessary for starting.

From these calculations a grade of from 1.75 to 2 per cent. in the empty-storage yards, especially at the upper end, should not be excessive, since these grades should start the car on release of brakes. Even if designed for a 2 per cent. grade, the fill material used to obtain this grade, often being rock excavated in sinking the shafts, may settle slightly and thus avoid any danger from too steep an inclination.

If the grade from the empty-storage yard to the tipple is made 1 to 1.25 per cent., the average car should move slowly and with uniform velocity to the point above the tipple, where it is desired to hold the car, although 1.25 per cent. should be used in case the grade in the storage yard is not sufficient to give the car a slight acceleration. Possibly on these grades the car would have to be pushed to restart it after having been stopped. A slight increase in grade at this point, perhaps 50 to 100 ft. above the tipple, should be beneficial, although this is not common practice. The provision of a 2 per cent. grade for 50 ft. above the center line of the tipple appears desirable, since while loading the car must be started and stopped frequently.

For the loaded car 1.75 per cent. grade at the tipple and for 50 to 75 ft. below it should be sufficient to start and accelerate enough to continue it in motion over the loaded-scale on the reduced grade of 0.85 to 1 per cent. Below this point the grade may be reduced in the assembly yard according to its length in order that the cars may be brought to rest easily.

Where grades of 2½ per cent. can be obtained under the tipple, I favor the use of a car retarder or some similar device, since danger from runaways is avoided and each car is under complete control at all positions during loading. This makes it possible to load every car to its maximum capacity, and with an even top load that will resist jarring.

Finally the foregoing represents only the average calculated case and consequently should permit easy control of a maximum number of cars. It agrees closely with good practice. In no case, however, can the established grade care for all cars at all seasons under the variable conditions noted, and for emergencies a car puller should be installed.

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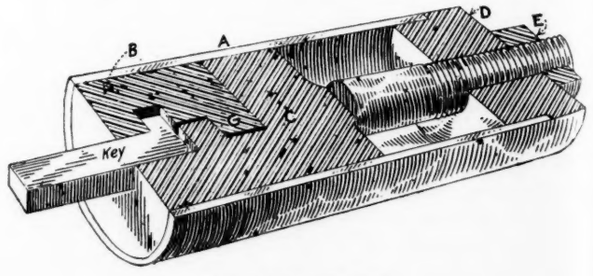
A Gib-Key Puller

By J. A. Moffat

A gib-key puller is shown in the illustration. It consists of a sleeve *A*, made from iron pipe; a member *B*, which holds the key; and the puller *C*, with a tongue *G* which engages *B*. The washer *D* rests on one end of the sleeve *A*. The other end of the sleeve rests on the hub of the pulley. When the nut *E* is screwed down, the key puller and the key are drawn through the sleeve. For handling different sizes of keys the member *B* is the only part that need be changed.—*American Machinist.*



GIB-KEY PULLER

Mining Plant of the Red Deer Valley Coal Co.

The property of the Red Deer Valley Coal Co., Ltd., consists of 3,200 acres of coal lands under lease from the Canadian government for a period of 21 yr. with renewal privilege for an additional 21 yr. together with sufficient surface rights for all headworks, yards, tracks, etc. About 2¾ mi. of standard-gage railway was constructed to connect the mine with the Calgary-Saskatoon line of the Canadian Northern Ry. and provide the present yard room for 75 cars.

The topography of the section is of sufficient interest to warrant mention here. The Red Deer River flows in a deep cañon in this section, being from 400 to 600 ft. below the average land level of the prairie country on each side. This has a decided effect on railroad building and on mining conditions as well, for while the area of coal deposits is of some extent, the railroads are compelled to follow the watercourses far below the land level, and transportation is to be had only in the deep narrow valleys. For years to come this fact will tend to restrict the output of the district materially. At few places in this valley is there room for adequate headworks and proper trackage facilities for large operations.

The property of the Red Deer Valley Coal Co. contains five seams of coal within a depth of 220 ft. from the level of the flat where the works are situated. No. 2 and No. 4 seams afford exceptional conditions for operation. No. 2 seam contains approximately 6 ft. of coal. No. 4 seam, at a depth of 160 ft. is 10 ft. in thickness and contains 9 ft. 4 in. of coal found in three benches separated by two narrow partings. The conditions as a whole are ideal for machine mining. The coal is of a sub-bituminous nature with splendid physical characteristics, being bright and shiny and comparatively free from slack, dust and dirt of any kind. It stands handling and shipping exceptionally well.

The beds of this field are almost perfectly flat, and the roof and floor conditions in this mine are of the best. There has been no faulting discovered so far in the district. The mine is free from water as far as the seam being mined is concerned. Such pumping as is necessary is due to a small flow encountered when the shaft passed through beds above.

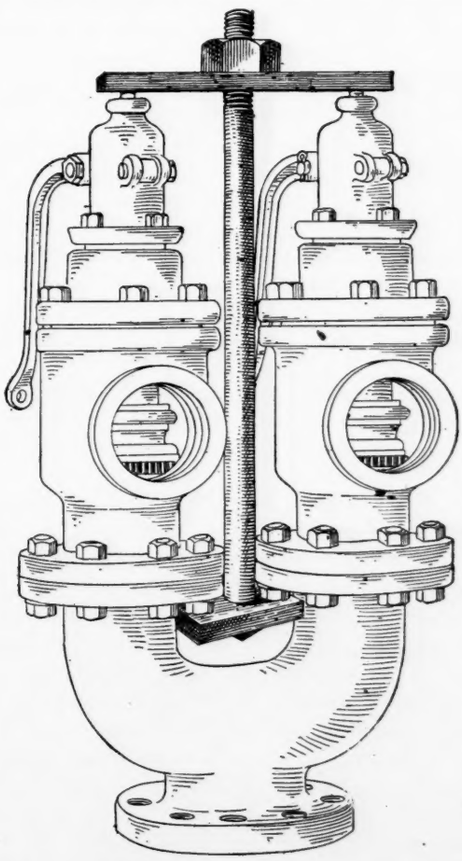
With the quality of coal available the owners of the Red Deer Valley Coal Co.'s Mine felt assured that the best of machinery and facilities were warranted in the installation. Everything possible was done to provide for a large output and to insure carefully prepared and graded coal for market. The shaft was constructed 10x19 ft., providing for two Herzler & Henninger self-dumping cages and a pipe compartment, and was lined with the best of Douglas fir from the Pacific Coast. The main entry was driven 16 ft. wide, and prepared for double tracks of 30-lb. steel. A Vulcan hoist with 60-in. drums winding a 1-in. Leschen wire rope hoists the cars to the top of the tipple structure, where they discharge over bar screens into a Fairbank's weigh-basket equipment and thence on to the 76 ft. Marcus vibrating screen, especially designed for this order by the English makers, Head Wrightson Co. The extra length of this screen allows for a wide range in the grading of the coal and marks a new departure in coal preparation for the Canadian West. The tipple is provided with four loading tracks in addition to the main spur track, which can also be utilized for the purpose.

The power equipment is of the best; the arrangement for economy and the ease of handling has been commented upon by a number of power men. Two Jenckes boilers, of 150 hp. capacity each, furnish steam at a working pressure of 150 lb. to the Vulcan hoist and the Robb-Armstrong engines driving the two Westinghouse electrical units. The current is furnished by 125-kv.-a. 220-volt generators which are equipped with 10-kw. exciter units. The No. 13 Sirocco fan with capacity of 100,000 cu.ft. is driven by a 75-hp. motor.

The construction work on this plant was something of a record for the West, as the shaft sinking was begun in April, 1914, and the installation was complete and operating Dec. 8, 1914. While subject to the usual inconveniences of machinery installation in a new country, the development work was carried on simultaneously with construction and the plant was able before the close of the season to attain an output of approximately ⅕ of its capacity of 1,000 tons in 8 hr.

Holds Pop Valve Down

A simple device is here shown for use in the hydrostatic test of steam boilers, says Edward T. Binns in *Power*.



BOLT FOR HOLDING DOWN SAFETY VALVES DURING HYDROSTATIC PRESSURE TEST

It is designed for holding pop safety valves upon their seats while pressure is raised for testing purposes above the point of blowing.

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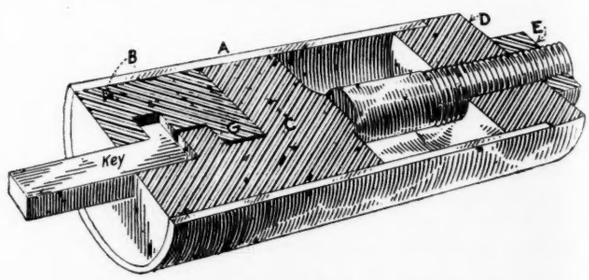

GIB-KEY PULLER

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The property of the Red Deer Valley Coal Co. contains five seams of coal within a depth of 220 ft. from the level of the flat where the works are situated. No. 2 and No. 4 seams afford exceptional conditions for operation. No. 2 seam contains approximately 6 ft. of coal. No. 4 seam, at a depth of 160 ft. is 10 ft. in thickness and contains 9 ft. 4 in. of coal found in three benches separated by two narrow partings. The conditions as a whole are ideal for machine mining. The coal is of a sub-bituminous nature with splendid physical characteristics, being bright and shiny and comparatively free from slack, dust and dirt of any kind. It stands handling and shipping exceptionally well.

The beds of this field are almost perfectly flat, and the roof and floor conditions in this mine are of the best. There has been no faulting discovered so far in the district. The mine is free from water as far as the seam being mined is concerned. Such pumping as is necessary is due to a small flow encountered when the shaft passed through beds above.

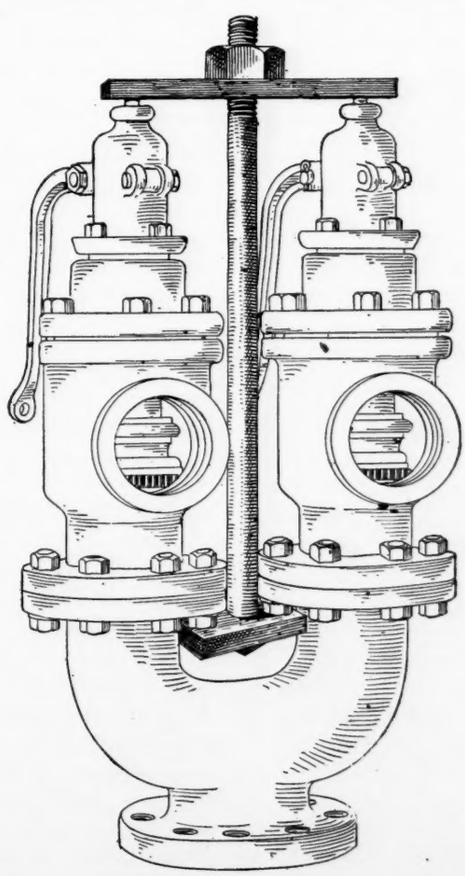
With the quality of coal available the owners of the Red Deer Valley Coal Co.'s Mine felt assured that the best of machinery and facilities were warranted in the installation. Everything possible was done to provide for a large output and to insure carefully prepared and graded coal for market. The shaft was constructed 10x19 ft., providing for two Herzler & Henninger self-dumping cages and a pipe compartment, and was lined with the best of Douglas fir from the Pacific Coast. The main entry was driven 16 ft. wide, and prepared for double tracks of 30-lb. steel. A Vulcan hoist with 60-in. drums winding a 1-in. Leschen wire rope hoists the cars to the top of the tipple structure, where they discharge over bar screens into a Fairbank's weigh-basket equipment and thence on to the 76 ft. Marcus vibrating screen, especially designed for this order by the English makers, Head Wrightson Co. The extra length of this screen allows for a wide range in the grading of the coal and marks a new departure in coal preparation for the Canadian West. The tipple is provided with four loading tracks in addition to the main spur track, which can also be utilized for the purpose.

The power equipment is of the best; the arrangement for economy and the ease of handling has been commented upon by a number of power men. Two Jenckes boilers, of 150 hp. capacity each, furnish steam at a working pressure of 150 lb. to the Vulcan hoist and the Robb-Armstrong engines driving the two Westinghouse electrical units. The current is furnished by 125-kv.-a. 220-volt generators which are equipped with 10-kw. exciter units. The No. 13 Sirocco fan with capacity of 100,000 cu.ft. is driven by a 75-hp. motor.

The construction work on this plant was something of a record for the West, as the shaft sinking was begun in April, 1914, and the installation was complete and operating Dec. 8, 1914. While subject to the usual inconveniences of machinery installation in a new country, the development work was carried on simultaneously with construction and the plant was able before the close of the season to attain an output of approximately ⅓ of its capacity of 1,000 tons in 8 hr.

Holds Pop Valve Down

A simple device is here shown for use in the hydrostatic test of steam boilers, says Edward T. Binns in *Power*.



BOLT FOR HOLDING DOWN SAFETY VALVES DURING HYDROSTATIC PRESSURE TEST

It is designed for holding pop safety valves upon their seats while pressure is raised for testing purposes above the point of blowing.

A Better Coal Standard

By Xeno W. Putnam*

SYNOPSIS—No standard, easily understood and readily applicable, at present exists whereby the ordinary consumer may judge the actual value of one coal as compared with another or with some other fuel. A great opportunity here exists for an educational campaign by some public-spirited operator.

Every industry, however exclusively it may appear to be concerned with the production of something, has a commercial side, without which it would never be of importance to mankind. There are, in fact, two distinct phases to all industrial enterprise—that which has to do with the production of something for the market, and that which prepares the market for a sane and intelligent demand for the finished product of the industry.

Because a certain proportion of industrial workers concern themselves entirely with the producing end of their business and are content to ride into market upon the commercial horses supplied by somebody else, we are neither to conclude that the commercial phase is absent nor that its development is only of concern to a small part of its workers. Good markets are essential to the prosperity of any business and to everybody however remotely connected with it—good markets and an intelligent conception of true values.

Why so little has been written upon the building up of the coal industry from the market end is hard to determine. There is no ethical law to oppose the commercial manager. There is no overplus of popular understanding. Some of the larger consumers may have dipped into a practical knowledge of relative caloric values, but to the great body of smaller consumers, "coal that isn't slate is coal." True, the average consumer can run off a more or less extended list of general classifications, but they are usually so jumbled together so far as systematic value goes that they only add to the popular confusion by creating impressions that are incorrect.

We cannot believe, on the other hand, that the market limitations have been reached—not while there are inferior but successful fuel rivals in the field. To the universal necessity of market-building the coal business is not an exception and never will be. Whenever there is no more room for bigger markets, there are opportunities for better markets, for better prices, for better selling conditions; and from none of these possibilities is the production and marketing of coal exempt.

But between the bigger and broader markets that might be thrown open to it and its present position, there is unfortunately an obtrusive barrier—no, rather a gulf, for the break is due to an absence instead of to an obstructing presence. The powers that are producing the world's coal and placing it upon the market have forgotten to standardize its values, or at least to standardize in terms that are intelligible to the consumer.

*Harmonsburg, Penn.

There is no real difficulty in correcting this. True, it may not be possible to fix with a certain field output a definite heat value because such values vary greatly in different parts of a single field. There are, however, known to the big coal producers and to a few of the big consumers, standards of valuation that approximate the heat values of one coal both in relation to others and when compared with other kinds of fuel. There are standards known to the few, comparatively, which determine into what field of usefulness a certain output best fits, what its degree of usefulness is for coking purposes, for the blast furnace, the foundry, the residence.

What the consumer needs, what the public needs in order to become a part of a better market for the coal output, is a systematic drill in those standards of value—what each is worth for a specific purpose. Under present conditions the value of black diamond is being continually judged in comparisons of operating and fuel economy under unfair disadvantage because the tests are made with grades and under conditions that no practical mine operator would, if consulted, consent to for a minute. Such tests are being made in ignorance, but the results reflect as definitely against the entire coal industry as though they were intelligently performed. This is particularly the case if the tests happen to be pitting coal against some other kind of fuel and not if they merely compare the outputs of different fields.

Values of Fuels Should Be Generally Known

The first principle upon which any hope of better markets can be built is better knowledge among consumers. Because a man can recite a few dozen such terms as chestnut, egg, slack, Pittsburgh vein, mine run, etc., we are not to believe that they mean anything to him that will help him fix their place or relative values; indeed, the very complexity of his list should assure us that his groupings are little short of the grotesque in their lack of system. In putting the matter into terms of dollars and cents in relation to his own business, his knowledge may avail him hardly at all.

Some of this confusion may be charged to causes for which Nature must herself be held to account, but not all of it. So long as there are definite relative values available for the expert, an approximation of them can be given out that will at least aid the general consumer. The average petroleum user may not understand the ins and outs of all the different oil fields or of the Pennsylvania, Texas or Indiana product; still each field suggests to him, in general terms at least, special values as an illuminant, a lubricant, or as a fuel. In a similar way the various coal fields and some of their simpler groupings have economic and industrial meanings for the coal expert which might to mutual advantage be passed along to the general consumer.

Up to the present time there has been practically no effort on the part of producers or anyone else to give the general user even the rudiments of coal valuations that will be applicable to his own business or that he can by any reasonable effort of his own apply to it. He asks the price of coal of his dealer; then he compares

it, not in terms of actual heat value as expressed in available calories, but too often in the number of dollars of purchase price for a given weight.

Approximate Values Should be Available

Every consumer however small, every prospective consumer however remote, and above all, every dealer no matter what his trade obscurity should be taught or should have available the teachings that will give to each the approximate values, at the current price of some basic standard, of the various gradings in the different fields. Almost every village, however small, has at least one coal dealer, while all of the important cities have many. Compared with the consumption of coal in the strictly industrial centers, the factories, furnaces, etc., the handlings of any one of these retailers seem insignificant, yet the aggregate of them amounts to many thousands of tons. This output, sold mainly by men whose own estimate of coal consists to a great extent in the experience and observation acquired from the daily use of shovel and scales, goes into the hands of individuals who know nothing about coal or its economic use and who have no means, save that of their own experience, of finding out.

Is it any wonder that the coal trade is at present in the age of ignorance and tradition, when we come to the thousands upon thousands of small consumers? A certain grade from a particular field will gain or lose a neighborhood reputation because the conditions under which some local nabob tested it happen to be favorable or the reverse. To the mine operator the condemnation of an individual or a neighborhood amounts to little. To the coal industry in general it is another unsound brick in the commercial structure, and no business that is worth the building can contain too many unsound bricks.

There is a tremendous mission for the operator who is public-spirited enough to start a campaign of public instruction; something that will reach not only the big factories but the small dealers and consumers. Here is where the knowledge will do the most good because here is where it is most needed. The mills and factories have their own experts; they require little such assistance. What they do need is every improvement that can be put into the entire coal business, and of every such improvement they will get the greatest service, as the biggest consumer always gets the greatest amount of good out of all things that add to the prosperity and efficiency of those servitors upon whom his own prosperity depends.

Every business structure, whether general or restricted, rises or falls in its relations to public utility as its commodities are controlled by sane or fictitious values. The standing of any industry may be measured by the close relationship that exists between its consuming and producing ends, upon how closely the one moves in harmony with the other. This is but another way of saying that the price of the product must be fixed upon its known value to the man who pays. It goes without saying that cordial relations cannot long exist between true and fictitious values. It is therefore of first importance that true values be determined and that both producer and consumer be brought to recognize and accept the same standard.

The coal industry is no exception to this rule. The fact that there is a big demand for fuel does not in any sense release the leaders of the industry from their duty of educating those who have no method of their own by which they may reach a discerning sense of values. Present conditions will not always prevail; even if they did, that industry is in constant danger and is hampered in efficiency which is founded upon the ignorance of any of its parts, of which the consumer must be recognized as one. The circumstance that there is now a compelling call for coal does not divorce us from the fact that an intelligent demand is vastly more valuable in the end than any forced demand.

Eastern Asia Minor Has a Large Number of Coal Seams of all grades which occur in the region extending east of the 34th meridian east of Greenwich to the Russian and Persian boundaries. Lignite was reported by Cuinet from Tavshandagh Mountain in the vicinity of Mersivan. The same observer noted coal outcrops in the immediate neighborhood of Tokat, as well as in a district lying 60 mi. southeast of that town. Outcrops have also been detected at Cardashlar at 2 hr. distance from Sivas. Lignite is known at Ghemerek and at Tonus in the same district. Farther south lignites have been observed by travelers in the vicinity of the Argana copper mines. In the Erzerum province some lignite has been mined to supply local requirements.—Leon Dominian in Transactions of the A. I. M. E.

THIS BALDWIN-WESTINGHOUSE LOCOMOTIVE WAS BUILT FOR THE BERWIND-WHITE MINING CO. AND IS THE LARGEST LOCOMOTIVE IN THE WORLD DESIGNED FOR USE IN COAL MINES

Great Britain Fixes the French Coal Prices

Press reports from London state that the following official announcement has been issued by the Board of Trade:

Arrangements have now been completed in England and France for regulating the supply of coal to France from the United Kingdom, the new arrangements having come into operation on June 1. The interests have drawn up a maximum scale of freights, a maximum scale of coal prices, and a tariff for the services rendered by the coal exporters in the various districts.

All orders for coal from France will pass through one central office in Paris, and will be forwarded to local committees in the various coal districts of the United Kingdom, who will distribute the orders and see that they are carried out. They also will arrange for all the shipping required.

The prices of coal which are to come into force on June 1 have been officially published on the Cardiff Coal Exchange, as follows, per net ton: Large steam, $7.20; colliery small, $4.80; washed nut, $7.20; washed bean, $6.84; washed pea, $6.50.

These prices are considerably higher than those put forward recently as a suggestion by the president of the Board of Trade, whose proposal was that the prices ruling on Mar. 8 should be adopted with a deduction of 20 per cent. They are practically 40 to 50 per cent. below the values at present obtainable on the Cardiff market for prompt supplies.

The announcement states that exporters, whether colliery owners or merchants, are to receive as remuneration 5 per cent. in addition to the f. o. b. price, with a maximum of 24c. a ton.

U. S. Census Report on the Gas Industry for 1914

A summary of the general results of the 1914 census of manufactures with respect to the gas industry has been issued by the Bureau of the Census, Department of Commerce. It consists of a statement of the quantities and cost of the principal materials used and the quantities and values of the products manufactured.

Returns were received from 1,284 establishments in 1914, the total products of which for the year were valued at $220,237,781. Of these 1,284 establishments, 427 produced carbureted water gas; 274, straight coal gas; 156, mixed coal and water gas or mixed coal, water and oil gas; 150, oil gas; and 165, acetylene.

The gas products comprise 203,730,191,000 cu.ft. of gas, valued at $175,065,930, consisting of 10,509,946,000 cu.ft. of straight coal gas, valued at $10,726,514; 90,017,725,000 cu.ft. of carbureted water gas, valued at $74,516,534; 86,281,339,000 cu.ft. of mixed coal and water gas, valued at $72,012,021; 16,601,805,000 cu.ft. of oil gas valued at $15,044,509; 137,964,000 cu.ft. of acetylene, valued at $2,511,634; and 181,412,000 cu.ft. of other gas, chiefly if not entirely gasoline gas, valued at $254,718. In addition, the gas plants produced for sale 114,091,753 bu. of coke, valued at $8,719,910; 125,938,607 gal. of tar, valued at $3,252,756; and ammonia liquors, ammonium sulphate and hydrocarbons, valued at $1,405,540.

At the census of 1909 there were reported 1,296 establishments, with products valued at $166,814,371. Of this amount $138,615,309 represented the value of 150,835,793,000 cu.ft. of gas; $5,723,215, the value of 82,049,683 bu. of coke; $1,875,549, the value of 78,339,880 gal. of tar; $770,211, the value of ammonia liquors and hydroçarbons; $12,786,697, the value of other products; and $7,043,390, the receipts from rents and sales of lamps and appliances.

The value of all products in 1914 was thus $53,423,410, or 32 per cent. more than in 1909; and the output of manufactured gas in 1914 exceeded that in 1909 by 52,894,308,000 cu.ft., or 35.1 per cent., in quantity and by $36,450,621, or 26.3 per cent., in value.

There is a large amount of gas made in coke establishments and used for illuminating and for domestic fuel. The gas purchased by the gas companies is largely retort coke-oven gas. The following tabular statement gives the byproducts obtained in the manufacture of coke in retort ovens in 1909 and 1914, as reported by the Geological Survey:

BYPRODUCTS OBTAINED IN THE MANUFACTURE OF COKE IN RETORT OVENS: 1914 AND 1909

	1914	1909
Gas, cu.ft. (thousands)	61,364,375	15,791,220
Tar, gal.	109,901,315	60,126,006
Ammonia, sulphate or reduced to equivalent in sulphate, lb.	170,763,906	123,111,197
Ammonia liquors, gal.	5,938,233	.....
Anhydrous ammonia, lb.	25,370,509	4,871,014
Other byproducts, value	$997,007	$380,355

The consumption of gas-making fuels by the gas companies comprised 6,116,672 tons of coal, costing $20,872,517, in 1914, as compared with 4,940,598 tons, costing $16,304,832, in 1909 and 964,851 tons of coke, costing $4,706,602, in 1914, as compared with 591,919 tons, costing $2,667,706, in 1909.

There were consumed, in 1914, 65,036,504 bu. of coke, 27,372,589 gal. of tar, 1,121,108,000 cu.ft. of gas and 99,238 gal. of benzene or benzol, all of which was made in the establishments where consumed. The corresponding figures for 1909 are 49,550,153 bu. of coke, 31,590,178 gal. of tar, 1,730,563,000 cu.ft. of gas and 302,994 gal. of benzene or benzol.

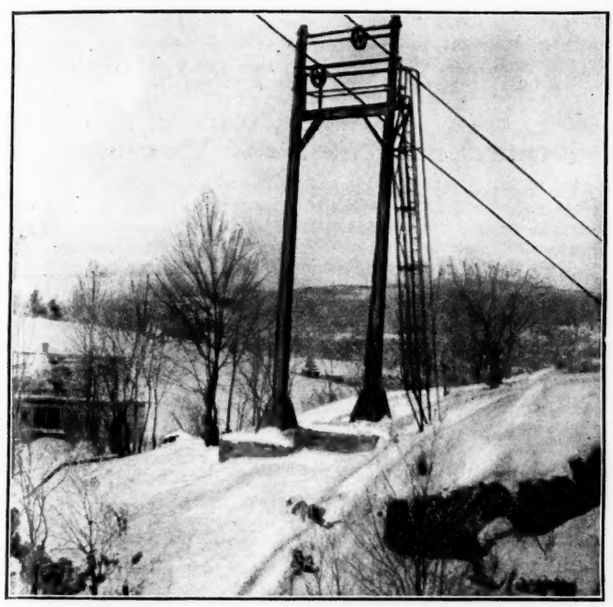
The mileage of mains increased from 45,119 in 1909 to 58,727 in 1914, or by 30.2 per cent. There were reported 5,168,924 gas stoves and heaters in use in 1914, as compared with 3,603,435 in 1909, the increase being 43.4 per cent. The number of gas stoves and heaters reported cannot, however, be considered as representing the actual number in use.

Of the 1,284 establishments reported for 1914, 131 were located in New York, 113 in Iowa, 99 in Pennsylvania, 75 in Illinois, 66 in California, 61 in Massachusetts, 60 in Indiana, 59 in Michigan, 48 in Nebraska, 47 each in Minnesota and Wisconsin, 43 in New Jersey, 35 in Missouri, 27 each in Connecticut and Texas, 25 in Ohio, 22 in Virginia, 20 in North Carolina, 19 in Georgia, 18 in Maryland, 17 each in Maine and South Dakota, 14 each in Alabama, Florida and New Hampshire, 13 each in Kentucky and Washington, 12 each in Kansas, South Carolina and Tennessee, 9 each in Arizona, North Dakota, Oregon and Vermont, 8 each in Colorado, Delaware and Mississippi, 6 each in Montana and Rhode Island, 5 each in Oklahoma and West Virginia, 4 each in Idaho, Louisiana and Utah, 3 each in the District of Columbia and Nevada, 2 in New Mexico, and 1 each in Arkansas and Wyoming.

Cable-Idler Stands of Concrete

At the Isabella mine, Palmer, Mich., says H. H. Hunner of Hibbing, Mich., in the *Engineering and Mining Journal,* the Cascade Mining Co. has three concrete idler stands. The largest is on a solid-rock bluff 80 ft. from the steel idler on the shafthouse. The span between the two poles of the stand was made great enough so that by adding a third it will serve the ropes on the cage hoist. A play of 3 in. was allowed between the side of the post and the idler hub at its outer position in fixing the location of the stand.

On the center line eight anchor-bolt holes were located 1½ and 3 ft. respectively on each side of the post. On lines at 45 deg. and 90 deg. to the first line, 16 more holes were similarly located. A jackhamer was used



ONE OF THE CONCRETE IDLER STANDS

to drill the holes 8 in. deep. Anchor bolts made of ½-in. round with 1¼-in. eye and an 8-in. shank were next cemented into the holes facing centers.

Forms were built to the full height of the stand. Reinforcing rods were welded full length and the bottoms given approximately the correct bend before being placed in position. The corner rods were ⅞ in. square and were carried to the top of the posts. The side rods were of 1-in. square ribbed steel, ending just below the horizontal crossbrace. Horizontal ties 1x⅛ in., made to fit inside the rods, were spaced 5 ft. apart. Starting with intervals of 20 in. from the top of the beveled pier, the rods were wired horizontally, ending with intervals of 10 in. at the top. Four ¼-in. square iron rods and three horizontal ties of ⅛x1 in., 4 in. square, were used as reinforcement in the 8x8-in. horizontal brace. Eight inches back from the ends the four horizontal rods were bent down and securely bound to the vertical rods in the posts.

The base forms were made of 2-in. hemlock, the pier and pole forms of 1-in. hemlock. The latter were made in three sections. The bottom section was 12 ft., the middle section 10 ft. and the top section 8½ ft. long. Three sides of the forms were nailed together on the ground and then placed around the rods and the fourth side nailed on. The form was lined in with a transit and spragged securely. The reinforcing rods were first bound to the horizontal crosstie at the collar of the beveled pier only.

As soon as the base forms were finished, the rock footing was washed clean and the rods spragged into position, using a transit to line up the bottom ring. The base was then poured, short lengths of rail, pieces of old cable, etc., serving as reinforcement. The forms for the beveled piers were immediately centered and filled. The mixing was all done by machine, the mixture in the base and beveled forms being 3-2-1. The same mixture was used in the poles, except that the pebbles were limited to a maximum of ¾ in.

The rods were wired in the two days during which the base was setting. The lower section of the pole forms was then centered, spragged and filled. The rods cleared the inside of the forms by 1¼ in., so it was necessary to watch them closely in tamping to keep them centered. The middle section was added after allowing a few days for the setting of the bottom section. The top forms were spragged to the lower sections of the opposite form already placed and filled. The top section was handled in the same way. The holes for the bolts were left by inserting a 1-in. iron pipe in the forms just the length of the inside dimensions of the form. The brace form was set into the sides of the top forms and filled at the same time. The forms were left on for several days, and then the whole stand was allowed to set for two weeks, after which the steelwork was added. The cost was as follows:

Total labor cost (ladder included)		$356.15
2,936 lb. reinforcing steel (1 in., ⅞ in., ¾ in. and ½ in.)	$46.98	
⅜-in. galvanized steel wire, 3-strand	4.00	
95 sacks cement	31.58	
Sand (cost of hauling)	27.00	
Total iron and steel (ladder included, reinforcing not included)	23.16	
Total costs		132.72
Total supplies		$488.87

The wood used in the forms was worth about $28 per 1,000 ft. b.m. new.

Recent Legal Decisions

Injury Caused by Unguarded Cogs—Excessiveness of Damages—In an action against a coal-mining company it is decided that failure of the company to safeguard cogwheels on machinery used to pump water from a mine, as required by the Indiana laws, may subject the company to liability for resulting injury to an employee engaged in work about the wheels. And $4,400 is not excessive recovery for injury to a 17-year-old employee, consisting in the loss of his left hand, where he had previously earned $2.48 a day. (Indiana Appellate Court, Epple vs. Queen Coal and Mining Co., 113 Northeastern Reporter, 19.)

Accidents in Entries—An employee in a mine, injured while passing over a trip of cars in an entry of varying width but which was not wide enough at the place of the injury for him to pass on either side of the cars, cannot recover from his employer on the ground of the narrowness of the entry unless it be shown that it was practicable and necessary to make the entry wider at the place where he was injured. The omission of the operator to provide manholes in an entry at intervals of 60 ft., as the Kansas law requires, is not ground of recovery for one injured in the entry unless there is a causal connection between such omission of duty and the accident or the circumstances were such that the injury might have been avoided if the manholes had been provided. (Kansas Supreme Court, Opoltnik vs. Cherokee & Pittsburgh Coal and Mining Co., 158 Pacific Reporter, 21.)

The Labor Situation

General Labor Review

In the anthracite region strikes have been more rather than less numerous and more ingenuity than before has been used in finding excuses for them. Many of the recent ones have not been about the 8-hr. day, which seemed a few weeks ago to be the main cause of discord.

A new labor union in the northern anthracite area threatens the United Mine Workers of America. That union, in a very creditable way, recently expelled two locals, Nos. 1,403 and 1,358, which had been paying benefits to miners who struck in violation of the contract. The union obtained writs of replevin from the courts for the funds and books but the attorneys of the locals filed bonds to retain possession of both until the issue has been determined by the courts.

The locals affected have about 2,800 members and their holdings amount to nearly $25,000. The sheriff has some of the books and papers of local No. 1,358, and that local is now petitioning for an injunction to compel their restoration.

The Anthracite Conciliation Board has given two decisions in favor of the miners, one of which gives the strip miners an increase of nearly 29 per cent. on the hourly rate of pay and another, giving electrical workers who work over 8 hr. a day a 7 per cent. increase in wage.

The Pittsburgh miners now have no unsettled difficulties, but the Allegheny-Kiskiminetas disputes are not ended.

In the central Pennsylvania district, Somerset County still has idle mines and the introduction of strike-breakers is threatened. The Williams Run Coal Co.'s miners near Punxsutawney have gone on strike, claiming that their pay has been delayed. The company declares that the miners have miscalculated the payday owing to the early pay prior to the Fourth of July.

West Virginia Has a Severe Labor Shortage

Albert J. Kern, city clerk of Fairmont, W. Va., on July 21 wrote the Government employment bureau that 10,000 laboring men were needed in the Fairmont region mostly by the mine operators. He stated that the average miner's wage was from $40 to $65 for two weeks or $80 to $125 a month. The laborer's wage he placed at from $2 to $2.50 per day. In the State of Indiana there is a similar shortage of labor due to the war and the stoppage of immigration.

The McGraw Coal Co., at Simpson, Taylor County, W. Va., near Grafton, has started to work after a strike of several months. The union will be recognized and a wage raise of approximately 5 per cent. granted. This mine failed to make an agreement with its men when all the mines around were successful in so doing.

Southwestern and Western Developments

In the Southwest on July 20, the joint subcommittee recommended a basis for agreement which follows the McAlpin contract with great fidelity. It calls for an interstate contract to govern strip-pit mining.

In the West, Charles H. Moyer retains his control over the metal-mining union men, recently so severely threatened. He has been reëlected to the presidency of the American Federation of Labor, defeating George Powell, the anti-administration candidate by 1,526 votes. An attempt was made by some desperadoes on July 21 to dynamite the home of Charles O'Neill, superintendent of the Colorado Fuel and Iron Co., at Starkville, Colo. Two women sustained minor injuries from flying glass and plaster.

New Anthracite Workers' Union

The union has been threatened so often by new organizations that one more is hardly likely to disturb the serenity of the leaders of the United Mine Workers. Some day, however, some organization may well take advantage of the disaffection and permanently lead large numbers away from the present international union.

On Saturday, July 22, representatives from 25 locals met in the Owls' Hall, at Wilkesbarre, and formed what is to be known as the Anthracite Mine Workers' Organization, choosing the very name by which the United Mine Workers of America is addressed by the anthracite operators. When they made the last contract with the mine workers, the operators, it will be remembered, refused to consider the union as a national body and preferred to regard it as an organization acting in behalf of anthracite miners only.

It has pleasced this new organization to gratify this desire of the operators up to the hilt by taking the very name the operators chose as a designation of the union. The officers of the new organization will be Robert Horn, of Parsons, president; Joseph Grescavicz, of Breslau, vice-president; and L. R. Mitchell, of Shickshinny, secretary and treasurer.

There are 160 locals in District No. 1, which comprises the northern anthracite field, the area to which the new union is at present limited. There is much dissatisfaction, and the new union hopes to gather in the local unions one by one. President White had written a letter on disaffection in the ranks, but the meeting refused to consider it.

Board Makes New Decisions

The Anthracite Conciliation Board has taken the view that strippings come under its control, and it has decided that the Red Ash Coal Co. must grant its men the 3 per cent. wage increase and also grant the men an 8-hr. day. The day has been up to the present of a length of 10 hr., and so the company will have to pay the men 28¾ per cent. per hour more than in the past. The men only recently joined the union, and their case against the strip-pit operators was immediately taken up by the United Mine Workers of America, with the result just indicated.

The board also gave the electrical men of the Delaware, Lackawanna & Western R.R. an increase of 7 per cent. when working a straight day or by the month, wherever they are required to work over 8 hr., in accord with clause 1 e of the anthracite contract.

Lehigh & Wilkesbarre Decision

The Lehigh & Wilkesbarre Coal Co.'s superintendent, Lewis J. Davies, has appealed the case recently decided against him relative to the supplying of cars to mine workers whenever five or more of them desire to leave the mine. There seems a possibility that the decision of the lower court may be reversed on further consideration.

Judge Woodward used the law of reason in considering the case. The law required the men to be drawn from the "bottom of the slope" when five or more men presented themselves. Very correctly it seems that this should be interpreted to mean that men "at the various lifts" should be drawn from the mine when five or more desire that accommodation.

The argument drawn from the case of Ford vs. the Lehigh & Wilkesbarre Coal Co. was hardly needed. Here a footman had been killed and it was alleged that the company should have had the statutory manhole or safety hole at that point. The company claimed that the law called for a hole at the bottom of the slope and not at every lift, and the court swept away this defense, putting a reasonable interpretation on the law.

Unreasonable To Require Company to Hoist Men

But having been so reasonable, why did not the judge indulge himself in a little more reason? The men had contracted to stay in 8 hr., and the company could therefore have no men to hoist if the men kept their contract. Now this contract was not unreasonable and against public interest; in fact, it was clearly in favor of the interest of the public and therefore a good contract even if it was not an exactly legal one because it was not made with an actual person or an incorporated body.

But the presentation of these men at the lift was a violation of a legitimate contract, duly signed and duly ratified by the local representatives of the men, and reason would suggest that the company should not be compelled to draw the men from the mine to the undoing of the contract. Judge Woodward says truly: "All acts must have a reasonable construction, and if there was any conspiracy on the part of the

miners to use the act to annoy the operators by presenting themselves at unreasonably frequent intervals to be hoisted to the surface, the court would exercise its powers to prevent such an unreasonable use." He adds: "But there is no evidence in this case that there was any intention to make such unreasonable and oppressive use of the act."

Surely it is an unreasonable use of an act to use it to void a perfectly legitimate contract. But still the case is not important, for so long as the right and power of discharge remains and is used by the company, the law's provisions cease to have any importance.

Somerset County Mine Troubles

In Somerset County, Pennsylvania, the process of unionization proceeds with some disorder and intimidation. At a meeting of the Holsopple local on Friday, June 17, demands were made on the Victor Coal Mining Co. of that place that it permit the placing of a checkweighman at the scales, that it collect the checkoff and recognize the mine committee.

However, as Lloyd G. McCrum, the general manager of the company, was in the East the mine workers decided not to press their demands till his return in the middle of last week, when he promptly refused to comply with the provisions sought, and consequently the mine workers struck on Thursday, June 20, and the mine has been idle ever since. W. A. Merrill & Son, operating three small mines at Garrett, are also idle for the same reason.

The Knickerbocker Smokeless Coal Co. is progressing in its fight against the union, having 137 men working on July 20 as against 100 at the end of the preceding week. The mines of the company are located at Hooversville, and order is being kept by the local police and one deputy sheriff.

In the following statement Telford Lewis, the superintendent, declares that the wages paid by the Knickerbocker Smokeless Coal Co. are good:

The men who are at work are earning good wages and seem to be satisfied. Eleven miners during the last half of June averaged $53.10, working a total of 121 days for a daily average earning of $4.86. Seventeen miners for the first half of July worked a total of 156 days with an average daily earning per man of $4.62.

The best performance by one man was that of John Butsko, a Magyar. During the last half of June Butsko worked 12 days at pick mining, totaling 136 tons and 15 cwt., his earnings amounting to $81.31. For the first half of July the same man worked 12 days and mined 140 tons and 11 cwt., his total earnings for that period being $90.51. In the 24 days referred to this man mined 277.3 tons of coal, an average per day of 11.55 tons.

District No. 5 Grows Quieter

The locals in the Pittsburgh, or No. 5, district are not satisfied altogether with the vote by which the agreement between miners and operators was accepted. Several of the locals, such as Knob and Diamond locals at Brownsville in the Monongahela Valley, want a referendum taken, though apparently the Youghiogheny miners are satisfied with the settlement or, rather, feel it useless to leave the contract unratified. Apparently a referendum is not necessary under the rules of district No. 5, and in view of the overwhelming majority obtained at the recent convention, by those favoring ratification, it would not seem to promise any different result. Consequently the public and the operators may feel assured that the agreement is concluded even if a bitter feeling against the contract still endures.

The new president has named Robert Gibbons, a miner from Moon Run, as his preference in the filling of the vacant vice-presidency. In 1911 he ran against Francis Feehan for the presidency and was defeated. He has many enemies who would like to have seen another appointee, but the executive board of district No. 5 has appointed him vice-president nevertheless. It is said that William Hargest, an Ellsworth miner, will probably be elected International Board member.

Attention will now be directed to the labor difficulties farther north in the Allegheny and Kiskiminetas valleys, where 6,000 men are striking. A settlement is expected. The short strike at No. 3 mine of the Ford Collieries Co. is at an end. The dispute was about the prices charged for caps and powder. The men went out on strike on July 17 and in the evening voted to go back to work. No. 2 mine at Curtisville was idle a somewhat longer time. On July 20 all the idle men at Curtisville and Russelton returned to work after holding a conference at New Kensington with the new president, Philip Murray, who told them to go back to work as their strike was illegal. Thus all the men of the Bessemer Coal and Coke Co. and the Ford Collieries Co. are now at work, but one cannot tell how soon they will be idle again.

Miners and Operators Combine

Operators and miners of the Fifth and Ninth districts of Illinois, in conference on Saturday, July 8, at Belleville, Ill., adopted resolutions providing for a joint board of operators and miners which is intended to see that coal is sold at a price that will give the operators a profit and assure the miners their wage scale and proper working conditions.

The resolutions were submitted by a committee appointed at a previous conference, which was called to deal with conditions that had been created by the coöperative mining companies. The Saturday meeting was the largest and most important that has been held in the Belleville district in years. There were present 80 members of the Coal Operators' Association of the Fifth and Ninth districts of Illinois, 22 unassociated operators and all the officers and executive board members of the United Mine Workers of Illinois. The meeting lasted several hours, and the situation was discussed from every angle. The resolutions adopted contained the following recommendations:

To insure uniformity in the application of the wage scales and conditions of the contract, we recommend that all operators not now members of the association become members of the Coal Operators' Association of the Fifth and Ninth districts of Illinois, and thus come under the jurisdiction of the joint board as provided in the contract.

To insure more intelligent and better results in the marketing of coal, we recommend that all operators report their operating time and sales to a bureau or to a common representative, to the end that current prices, as shown by the records of actually past and closed transactions, may be known, and also that all may be supplied with truthful and accurate statistics relative to current production and market demand, in place of current scandal and misinformation.

That all operators adopt a uniform system of cost accounting that shall take into consideration:

a. The cost of production under proper and conservative methods of mining and the upkeep of mines and equipment in safe and efficient condition, in conformity with state law and with due regard to the wage scales and conditions provided in the contract with the miners.

b. Necessary provision for taxes, insurance and indemnity for killed and injured workmen and the other contingencies of the business.

c. The reserves necessary for the payment of debts and to redeem the invested capital and to pay a fair return thereon, to the end that the industry may be stabilized and permanency and regularity of employment assured.

In conclusion we agree that operators whose selling policies do not take into consideration the above enumerated elements entering into the cost of coal are unfair competitors and the cause of the present miserable depression in the coal industry.

The resolutions were signed by Frank Farrington, Frank Hefferley, Mose Johnson and Ed. Dobbins for the United Mine Workers, Thomas Brewster, Thomas Jenkins, P. M. Hucke and L. M. Lumaghi for the Coal Operators' Association of the Fifth and Ninth districts, and by Fred Nolds, Web Miller and R. J. Wilson of the unassociated operators.

Southwest Settlement Likely

The subcommittees of the conference between miners and operators in the Southwestern district reached an agreement on July 20, and it seems likely now that a schedule and contract will be arranged without serious hitch. The conference resumed its sessions Monday, July 24, and will probably continue until all the details of the contract are decided. The joint-scale subcommittee made the following report, which was accepted by the conference:

To the Scale Committee of the Southwestern Interstate Coal Operators Association and the United Mine Workers of America of Districts 14, 21 and 25.

Gentlemen: We, your subcommittee, on behalf of the miners and operators herewith submit to you the following recommendations as a basis of settlement, with a view of reaching a wage agreement to become effective on and after Aug. 1, 1916:

First—That there be an advance of 3c. per ton on mine-run coal, on coal obtained by solid shooting and on machine-mined coal, and 5c. per ton on pick-mined coal where the same has been paid in previous settlements under the Cincinnati and Cleveland agreements and where the same method of mining is continued.

Second—That all day labor, deadwork, yardage and room turning shall be advanced 5 per cent. on existing prices.

Third—That all internal differences are hereby referred to the various districts for settlement, with the understanding that only by mutual consent shall anything be done in subdistricts or wage-scale conventions that will increase the cost of production or decrease the earning capacity of the men. All rules now incorporated in existing contracts shall remain in force unless changed by agreement between the operators' and miners' representatives.

Fourth—That the Interstate Joint Conference consider and make proper disposition of all interstate joint decisions and joint rules and that the consideration and proper disposition of district and joint rules be referred to the joint conferences of the respective districts Nos. 14, 21 and 25 for their consideration and disposition.

Fifth—That this conference give consideration to the establishment of an interstate contract to govern strip-pit mining.

I. M. FLEMING, Chairman.
GEORGE HEPPLE, Secretary.

A further clause was added to the foregoing to make clear the procedure to be followed in preparing a new contract in accord with the understanding just quoted:

In order that there may be no misunderstanding as to clause 3 of the subcommittee's report, it is agreed that in working out an agreement the same policy shall be pursued as obtained in former joint conferences; that is, clause 1 of the present contract shall first be considered, and then those that follow until the entire contract has received consideration and been disposed of either by reaching an agreement or otherwise.

In view of the above understanding, it is agreed that everything that has been said on the subject be eliminated from the record. WILLIAM DIAMOND,
Signed by F. W. LUKINS.

The consideration of the miners' further demands has been left to a committee of 10 persons, composed of four operators and four miners and two acting in an advisory capacity. The committeemen and the states they represent are as follows: Operators—F. W. Lukins, Missouri; Ira Fleming, Kansas; H. N. Taylor, Arkansas; F. L. Hogan, Oklahoma. Miners—D. A. Franklin, Missouri; Alex. Howat, Kansas; J. D. Winters, Arkansas; Ira Decker, Oklahoma. The advisory members are Gus Sparling, of Thurber, Tex., member of the International Board of the United Mine Workers, and George Hepple, of Moberly, Mo., special representative of the union.

Miners' Union Can Be Sued

The United Mine Workers of America can be sued for damages on charges of conspiracy in restraint of trade the same as a corporation. The decision was given last week by the United States Circuit Court of Appeals in the case of A. S. Dowd, receiver for the Coronado Coal Co., of Sebastian County, Arkansas, against the United Mine Workers. Dowd asked $1,283,462 damages for alleged interference with the business of the coal company when it attempted to employ nonunion labor. The petition alleged that nonunion miners were intimidated and killed. The union filed a demurrer, setting up that it was not incorporated and contending that it would be necessary for suit to be brought against each of its 400,000 members. The United States District Court upheld the demurrer, and an appeal was taken to the United States Circuit Court of Appeals. The present decision is based on a law passed in 1890. The case will now be tried on its merits.

Lightning Protection for Smoke-Stacks

At the annual meeting of the National Fire Protection Association, held at Chicago, May 9-11, the Committee on Signaling Systems submitted interesting suggestions for protection of smoke-stacks against lightning, taking for example a stack 140 ft. high. The type and weight of conductors and other materials for use on stacks and the details of their installation are matters requiring in many cases expert investigation of the special conditions.

Two ground rods, the minimum number required for stacks of this type, are provided. A band of the conductor encircles the stack near the top, to which the air terminals and ground rods are connected.

The air terminals are spaced about 6 ft. apart around the periphery of the stack top and extend 18 in. above the rim. They are of solid material provided with a thread on one end to be screwed into clamp connectors assembled on the band; the other end terminates in a point.

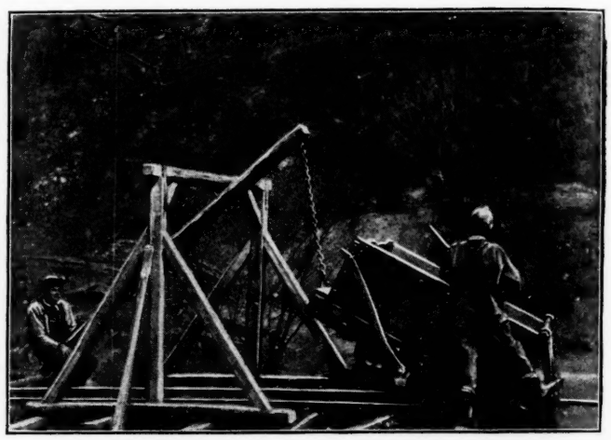
The air terminals are held in an upright position with fasteners set into the bricks as near the top of the stack as possible. The band encircling the stack is provided with fasteners not farther apart than 3 ft., and the ground rods are fastened at least every 5 ft.

All parts of the equipment which are subject to the corrosive effects of the smoke are protected by a covering of lead not less than $\frac{1}{16}$ in. thick.

Device for Dumping Waste Cars*

Dumping waste is an important factor in the cost of mining, especially when doing a lot of "dead work" or underground development. Any device which will lessen the cost of this operation is therefore worthy of consideration and installation if possible.

The apparatus shown, while by no means new to the coal-mining fraternity, may possibly be unknown to some and therefore may be worth a brief description. It has given entire satisfaction, having reduced the time of unloading about one-half, to say nothing of a material saving in labor. Before its installation two men and two boys were required to dump the car



A DEVICE FOR DUMPING WASTE CARS

(1¼-ton capacity); now two boys do the work with the expenditure of little effort. This type of crab, as it is called, may be pushed along on the ties as the dump pile advances, without trouble or any great loss of time.

Timber hewn on two sides, such as is used for mine ties, forms the framework of the crab, which is held together by 40-d. nails and two iron straps. The straps, chain and eye-bolts used on the lever, were taken from the scrap pile, and their cost may, therefore, be neglected. The cost of this crab figures up as follows: 58 ft. timber @ 1½c. per ft., $0.87; 4 lb. 40-d. nails @ 2c. per lb., $0.08; 7.5 hr. labor @ 17½c. per hr., $1.30; total, $2.25.

COMING MEETINGS

The American Mining Congress will hold its 19th annual session during the week beginning Nov. 13, 1916, at Chicago, Ill.

Michigan-Ohio-Indiana Coal Association will hold its annual convention at Cedar Point, near Sandusky, Ohio, Aug. 1, 2 and 3. Secretary, B. F. Nigh, Columbus, Ohio.

National Commissary Managers' Association will hold its 7th annual convention at the Hotel La Salle, Chicago, Ill., Aug. 8-10, 1916. Secretary-treasurer, Russell E. Lee, Manhattan Building, Chicago, Ill.

New York State Coal Merchants' Association will hold its annual convention Sept. 21-24 at the United States Hotel, Saratoga Springs, N. Y. During the convention addresses will be given on the most uptodate time-saving methods for both office and yard. The exhibition of coal dealers' supplies will be held on the interior covered porch of the hotel. Secretary, L. V. Shepard, Elmira, N. Y.

*Adapted from article of Roy S. Bonsib in "Engineering and Mining Journal."

Editorials

A New Policy

The coal industry has much to learn from other great fields of industrial activity, and in line with this idea the editors of *Coal Age* have inaugurated a plan of searching other technical journals for articles and information beneficial to the coal-mining profession. *Coal Age* has an arrangement with the *American Machinist, Power, Engineering News* and *Engineering and Mining Journal* whereby all articles prepared for publication in these papers are submitted to it for perusal before the articles are published by the journals mentioned.

This scheme will greatly increase the value of *Coal Age* to its readers, as the plan gives us immediate possession of all articles of mining interest that are produced by writers in the four important industries covered. We are sure our readers will commend us in this policy of broadening our contribution field and appreciate the professional courtesy that makes possible such a helpful exchange of information.

Truly, the day has come when the curtains of secrecy and selfishness between technical men have been pulled aside. Time was when members of a single industry were jealous of each other and every new idea was locked in a vault of silence. Today no coal operator would think of closing his doors to his neighboring competitors.

Spikes were put in the shoes of the base ball player to enable him to "hit a pace" around the bases. Every once in a while some bully who can't hit or run gets to first through a fluke and proceeds to try and score by sliding feet up and scarring his opponent's shins. If such a fellow was a coal operator, he would be just as bad a sport for he would steal all and give nothing. Fortunately, the coal business hasn't many such and it will be a bigger, better industry when it hasn't any of the kind that are so clever with a rake and so clumsy with a fork.

Moral Uplift in Washington

The remarks of E. N. Hurley, formerly vice-chairman and now chairman of the Federal Trade Commission, before the Associated Advertising Clubs contained many germs of truth about the changes that are needed in Washington before the Federal machine can be said to be either human or humane. Mr. Hurley's remarks were mostly on humanizing the department, though the steam roller of government has been at times so ruthless that the emphasis of most of us is on the lack of humanity which Congress and the departments too often display. Mr. Hurley says:

> **The United States Government, which I understand transacts 90 per cent. of its business by mail, does not write letters that pull. Most of them are addressed as "Sir—You are hereby notified," and the balance of the letter is generally couched in terms which put the recipient on the defensive and make helpful coöperation utterly impossible.**
>
> **I have been informed that a few years ago in one of the departments at Washington which comes in daily contact with the business men of the country it was found that the word "please" was being used in telegrams. Instructions were given to stop its use and employees advised that if they should in future use it in telegrams they personally would have to pay the expense.**
>
> **This same department took the position that when the Government acknowledged a letter from a business man, it was not necessary to say "We thank you for your favor of ——— date" on the theory that the Government did not have to thank anyone. Gentlemen, is there any quicker way to separate friends or to force customers off your books or to create a break between business men than to send out cold, sarcastic letters? I honestly believe that much of the ill-feeling that has existed between Government and business for the past 15 years has been caused by discourteous letters that are written by the departments at Washington to business men.**
>
> **It is unfortunate that our business men and our Government have been losing time during the past 15 years in trying to settle our economic and business problems not by coöperation, not by any scientific method which will bring about results beneficial to our people as a whole, but by resorting to the courts. I know business has been sick, and business has undoubtedly been in a large measure to blame for its sickness, but instead of sending for a doctor who could prescribe a remedy that would give practical and permanent relief, the Government sent for lawyers, and you know the result.**

Fortunately all such aspersions have no relation to the bureaus with which mining engineers have to deal. The United States Bureau of Mines and the United States Geological Survey are extremely human and even humane in their attitude. They are always willing to strain a point to accommodate the public.

But some of the older bureaus which are so essential to the republic that no one could imagine the existence of the government without them are utterly without manners or scruples in the enforcement of the law. One of the "straightest sects" with which mining corporations have to deal is the United States Treasury.

Some years ago the corporation-tax law was passed requiring returns on profits by a certain date each year. Some concerns that had done little or no business, certainly not enough to pay any tax under the provisions of the law, were a few days late in making the return. Only one notice had been sent them, and they made their return without further notification. About a month after the time when the report had to be filed, and many days after the filing had actually been made, those who had been a few days late received a notice saying that they were liable to a $1,000 fine.

Later, in reply to their letters of excuse, they were told that under the Revised Statutes they could compound their criminality by the payment of a smaller sum of money which, on further inquiry, was found in one case to be, after all, only $10. No plea that the statute permitted the Treasury Department to grant a 30-day extension was allowed to protect the negligent from these minatory letters and disagreeable fines. No statement that the report was sent in reply to the one and only notice was held to show a sufficient desire to comply with the law.

When you deal with the United States Treasury Department, you deal with a sovereign—like my Lord of Stair—with no prerogative of mercy or of grace. Laws have been repeatedly passed to prevent private concerns conducting their business in such an overbearing way. Nearly every payment has from three to 30 days of grace under

the law. The courts have a way of protecting people who comply with their contracts even if a little late. Especially does the court defend those who comply and who, without immediate objection, have their compliance accepted, for acceptance of any kind is held to include not only the thing accepted but the terms with which, and times at which, the compliance was submitted.

The same heartlessness may be seen in the action of Congress in regard to compensation. It has been extremely slow to act where the money for compensation had to come out of taxes, but where it could come out of borrowings, as it could in the Canal Zone during its construction, the law was passed without difficulty.

Congress claims it has no money available for a big insurance charge. Business said the same, and the public required that it provide the money somehow. The people have a right to make Congress hear and do its part also, finding the money somewhere as business did.

The reforming politicians and bureaucrats would do well to reform themselves while taking on their shoulders the work of improving others. Manners and conscience are as valuable in the governors as they are in the governed.

Anthracite Strikes Frequent

One of the stock arguments of the union is that collective bargaining makes for peace and that nonunion mines are always hotbeds of disaffection, the baleful fruits of which are idleness, rioting, strikes and violence. But as a matter of fact the proposition is by no means proved in its entirety. Rioting and violence may be reduced by unionization and its recognition, but strikes and idleness seem to be most frequent at union mines.

The union has been recognized in the anthracite region. The operators have sat with the representatives of the union and with patience argued out the questions of wages and working conditions. A contract has been made as a result of this discussion, and the instrument in all its details has been approved by the miners' local representatives.

No one denies that the contract is being carried out to the letter by the operators, but the union men are nevertheless constantly striking with the hope of inducing the operators to write into the contract clauses that it does not now contain.

The operators at one time declared that the union did not represent the majority of their employees. It may be safely said that if it does not represent this majority it certainly misrepresents them in an unmistakable manner, for what the representatives of the mine workers agree to is reprobated by the represented, and the contract made was violated before the ink was dry and is being violated today.

At the Sloan mines of the Delaware, Lackawanna & Western R.R. there has been a strike about the kind of powder supplied, a perfectly justifiable basis for a grievance. But the contract requires such matters to be arbitrated and not made a reason for idleness. On July 21 the miners went back to work, the company having demonstrated after a test that the powder supplied was of a satisfactory quality.

At the Herbein colliery of the St. Clair Coal Co. the motormen struck because they were not getting the same wages as in the Philadelphia & Reading Coal and Iron Co. mines adjacent. We do not know whether they were or were not getting an equal wage, but it makes no difference. If the rate is that established under the contract the 20 motormen have no right to complain; and if the rate should by any chance be in violation of that contract the arbitration board is open to them and they can continue at work and get not only the correct wage from the date of protest, but back to Apr. 1 of this year or even earlier.

At the Archbald colliery of the Delaware, Lackawanna & Western R.R. the quarrel is about the laying off of men for whom there was no room in the mine. With the shortage of men in the region this was a matter that should have been easily met without a strike, and in fact the Archbald colliery is now again at work.

Then again there was a strike at the Nottingham colliery of the Lehigh & Wilkesbarre Coal Co. on July 15, because on the preceding day a driver had been told to do something and had refused and been discharged. Now if this act that was demanded of the driver was one that could not rightly be required of him, there was the arbitration board to reinstate him.

This strike was as needless as that at the Shenandoah and Centralia collieries of the Lehigh Valley Coal Co., on July 14, which was started because the miners wanted to be paid at an hour when they were required by their contract to be in the mine digging coal.

All these faults are not faults of the union leaders. They really have tried to make the men keep to their agreements; but when it is said that the union makes for peace, let these violations of a week be produced to show how little a contract really binds the mine workers.

Collective bargaining gives the workman too often only the idea of collective disorder. He does not recognize the bargain as being binding on him. He regards the union as a lever to break the solemn contracts he has himself made, and despite the efforts of the leaders the local union is a most powerful weapon for achieving that purpose.

While *Coal Age* has advocated a rational recognition of the union, it cannot avoid acknowledgment of the fact that the organization is not to be regarded as yet as in any way a reliable custodian of the rights of the operator. The union may loudly asseverate its power to compel its men to be loyal to contracts, but it is nevertheless true that even where the union leaders are willing, the rank and file of unionism is weak.

Advertising the Mines

Few men who are modern in their tendencies will deny that advertising is the soul of business, yet we may ride on railway trains through the very heart of great coal-mining districts, passing mine after mine, tipple after tipple, without a sign of any kind to enlighten the observer as to who might be the owner of the operations. Mine tipples are, as a rule, not pretty things, and generally they have but slight acquaintanceship with that landscape beautifier—paint. However, let us suggest to those operators who have decided to upset traditions that in the future when they do any painting they employ an artist sufficiently clever to outline the names of the mine and the company owning the operation. Such a plan wouldn't do any harm and might do some good.

Department of Human Interest

How First-Aid Training May Be Made More General

By J. E. Butler*

It is generally conceded that the present method of spreading the practice of first aid among the miners has been unsuccessful. And by the present method I mean the annual or semiannual first-aid contests for which a few companies train teams largely with the idea of winning prizes, thereby bringing the company represented more prominently before the public. It is a good, but by no means a cheap, advertising scheme for those who can afford to indulge in it.

The rank and file of the miners obtain about as much skill in first aid by this method as the average student in a big university obtains of health and strength by reason of his college winning a football championship. Yet each learns something about the work, and even a little is an advantage.

The question may be asked: "Is it not possible to so change the system of credits in a first-aid contest as to remedy some of the weaknesses of the present plan?" Anyone can see that there is a vast difference between the company that conducts a regular course in first aid throughout the year and has several teams as a result of this training and the company that engages, or happens to have, a first-aid expert to train a team of picked men a couple of weeks previous to the annual meet. Yet the company with the single team of selected men and the two weeks' training is apt to carry off all the honors of the field events.

Awards Made for Universality of Training

As a suggestion the following is offered with the idea of making first aid more general: Let the American Red Cross or the National Safety Council conduct examinations once or twice a year through the inspection departments of the various states and let them issue certificates of competency in first aid. The teams whose companies have the greatest number of these certificates per hundred employees should be given certain credits when they present themselves at a first-aid meet. Furthermore, the company having the largest number of teams per thousand men employed might receive certain credits, which would be transferred to the teams in the contest.

As a further test of the genuineness of the first-aid training, an oral examination might be conducted by the judges on the field. It would take but a few minutes to quiz each member competing and determine whether his knowledge was real or superficial.

These ideas are presented as suggestions, and it is hoped that they will cause a discussion of the means whereby more real and rapid progress may be made in imparting a knowledge of first aid to the injured to the whole rank and file of the mine workers of America.

*General manager, Stearns Coal and Lumber Co., Stearns, Ky.

Division Meet at Shenandoah

The first-aid corps of the Mahanoy and Shamokin division of the Lehigh Valley Coal Co. met at St. Ignatius Hall, Centralia, on July 8 to decide what team would represent the division at the general first-aid meet of the company to be held on the following Saturday.

Of the 15 teams competing, Packer colliery No. 5 shaft, inside, received first honors. Centralia, inside, made an equal score. Packer colliery No. 5 slope, inside, was third; Logan colliery, inside, was fourth.

Both Centralia and Packer No. 5 shaft made 100 per cent. and the higher award was given to the latter not for execution but for speed. The 15 teams had an average of 97.

Lehigh Valley Coal Co. Meet

The Lehigh Valley Coal Co. held its annual first-aid meet at Hazle Park, Hazleton, Penn., on July 15, the first honors falling to the Derringer team of the Lehigh-Coxe division. The Westmoreland and Lackawanna division took second place, only seven-fifths of a point separating it from the winners. Two years ago it held first place. The other teams obtained scores as follows: Packer No. 5, Mahanoy and Shamokin division, 81.08; Vulcan, Delano division, 80.67; Prospect, Wyoming division, 80.08.

The exercises opened at 10 a.m. with speeches by General Manager Chase and Dr. Mengel, the head of the new welfare department. The judges were Doctors Lathrop, of Hazleton; Geist, of Wilkes-Barre, and Lake, of Kingston, all mine doctors of experience. To be a good judge of first aid a man needs to be a mine doctor, for only such persons have at present the right experience and the needed training. The average town doctor has usually only a cursory knowledge of first aid.

M. W. Price, of Hazleton, was field manager; Jesse Briggs, of Wilkes-Barre, scorer, and Herbert Quinn and Merle Grewolliger, both of Wilkes-Barre, timekeepers. At a lunch served by the force of the Hotel Reddington the men and guests numbered 630. Eleven members of the first-aid team of the New Jersey Zinc Co. were among the spectators, being sent there by that company to watch the contests.

Retail Prices of 17 Principal Articles of Food declined on an average of 1 per cent. from 1914 to 1915, according to the Bureau of Labor Statistics. The declines were all in meat and dairy products. Flour advanced 20 per cent., corn meal 3 per cent. and sugar 11 per cent. It must be remembered that this index compares the average of the whole year 1915 with that of the whole year 1914. In March, 1915, the average price sank to its lowest point. Throughout the rest of the year prices rose until the final level was 6 per cent. above the average rate for the year. The miner is probably facing larger prices for food now than at any other time since the Civil War, but he has an increased wage to offset the advance.

The Vancouver Island Mine-Safety Association was formed on Sunday, June 18, at the Government Rescue Station, Nanaimo, B. C., with the following officers: J. H. Cunningham, of Ladysmith, manager of the Extension mines of the Canadian Collieries, Ltd., president; H. N. Freeman, manager Vancouver-Nanaimo Coal Co., East Wellington mine, vice-president; W. H. Moore, Nanaimo, secretary-treasurer. Committees have been appointed to draft a constitution and by-laws and to interview the Premier and the Minister of Mines relative to the participation of the government in the safety-first movement. At each colliery there will be a local committee of representatives of the employees and of the company, whose duty it will be to stimulate first-aid and rescue work and to introduce mine-safety methods at their particular mine. They will meet periodically and report. Delegates from each district will assemble at stated intervals for discussion. These delegates will form what will be known as the General Advisory Board and will have oversight of the first-aid, mine-rescue and mine-safety work in all the districts and in that way will coördinate and so standardize the methods adopted by all members of this safety association.

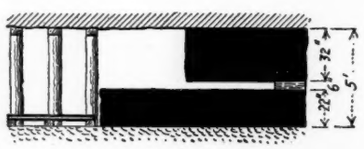
Discussion by Readers

Mining Thin Coal Seams

Letter No. 3—In answering the questions in regard to mining thin coal seams asked by "Superintendent," *Coal Age,* June 17, p. 1067, I should deem it necessary to know the character and thickness of the overburden above the coal, as well as the character of the roof immediately overlying each seam, in order to suggest the best method of working for maximum recovery and cheapest production. Then again, it would be necessary to know whether the seam lies practically horizontal or is pitching. Also, whether the seam must be opened at a point high on the pitch and worked down, or whether the opening can be made at a point low on the pitch and grades established on the main haulage entries such that the loads would gravitate to the shaft bottom or mouth of the mine. In the latter case the drainage problem would be much simpler and the haulage costs much reduced.

The seams described by "Superintendent" are quite similar to some inclined seams now being worked in the Los Cerrillos district of New Mexico, where the inclination is about 15 deg. to the horizontal and the seams are opened at about the height of the tipple above the railroad by driving the main slopes down the pitch. I do not claim to be familiar, however, with the detailed method of working the coal and agree that it would be interesting to hear from men who have had experience in working thin pitching seams similar to the ones mentioned.

In the Yankee Mine, at Yankee, N. M., I had some experience in cutting out clay bands in the center of flat seams of coal, using for that purpose Sullivan chain breast machines. The clay bands were located as shown in the accompanying figure. All our machines were bought with the intention of cutting in the bottom of the seam and were therefore mounted on low trucks, but by placing oak blocks on the axles below the beds of the trucks we raised the machines the height of the lower coal, which was left as a bench to be mined later, as shown in the figure. The machine could then be blocked and sumped in from its truck, the body of the machine resting on the lower bench of coal and the cut made across the face in the same manner as when made in the bottom coal.



The cuttings being clay shale were thrown back in the gob. The lower bench was then taken up and loaded out, a portion of that bench being left for the next cut. The top coal was next taken down. By this method the permanent timbering could always be kept within four or five feet of the face, or as close as by any other method. When cutting in clay bands of this character, the machines do not make quantities of fine coal dust to leak out of cars and be deposited along the roadways or be blown into suspension in the air and lodged on the timbers throughout the mine.

We had soft-clay bottoms about 6-in. deep in our seams and experienced considerable trouble when cutting in the bottom bench, owing to the need of using skids for the machines, to keep them from sinking into the clay. When cutting in the bottom coal, we also experienced trouble from the cutter-bar leading off into the softer bottom clay. The machines would sometimes then become stuck in the cut and have to be dug out. The scheme of cutting in the bottom clay was also tried. This was not found satisfactory on account of the uneven floor left for shoveling.

Ruth, Nev. H. L. HANDLEY.

Letter No. 4—I was interested in the inquiry of "Superintendent," *Coal Age,* June 17, p. 1067, asking for the best method of working three coal seams. As I have worked in the same seams he has mentioned, at Madrid, N. M., only three miles above Los Cerrillos, I thought I could make a few suggestions that might interest him.

The inquiry fails to give the inclination of any of these seams, but I assume that it is about 17½ per cent., which is the general inclination of most of these beds in New Mexico. Owing to the "very bad roof" in seam No. 1, it would not be advisable to use coal-cutting machines, since their noise when running would prevent the men from hearing any movement in the roof above them. But in seams Nos. 2 and 3, I would use the Goodman shortwall machines, as I consider them much easier to handle, especially in working places in mines where mule haulage is employed, since they have a self-winding cable and a friction clutch that enables the operator to regulate the travel of the machine according to the hardness of the coal he is cutting.

All three of these seams can be best worked on the panel system of mining, driving the main entries on the full pitch of the seam and turning cross-entries every 300 ft. apart to form the panels, allowing 50-ft. pillars between the heading and its aircourse, in each case. I would then turn all rooms on the full pitch of the seam and drive them 250 ft. in each panel. In seam No. 1, owing to the bad roof, I would turn the rooms on 50-ft. centers, making the openings 20 ft. wide, with 30-ft. pillars between them. The crosscuts, or dogholes, should be 90 ft. apart on the cross-entries and 50 ft. apart in the rooms, to secure good ventilation.

In my opinion it would be well to make the back heading the intake aircourse and haul the coal out on the return air. In seams 2 and 3 I would turn the rooms on 60-ft. centers, driving the openings 30 ft. wide and keeping the same 30-ft. pillars between them. I would use some good electric hoist to haul the coal out of the rooms. By means of small sheaves it could be hauled from four or five places at a single hoist. I hope these suggestions may be of some interest to "Superintendent," as I realize he has a hard proposition on his hands.

SAMUEL JONES, Mine Foreman,

Madera, Penn. H. B. Swoope & Co.

Accounting of Machine Coal

Letter No. 5—Referring to the inquiry asking for an easy method of keeping account of the coal cut by different machines and loaded by different miners, *Coal Age*, June 17, p. 1067, permit me to submit a plan that has been in use for several years at one mine where I am acquainted. It is as follows:

In this mine both the machine runners and the hostlers (drivers) are paid for the coal they cut and haul respectively. Each machine runner and each hostler is given a check number in the same manner as checks are given to each miner. When a miner first starts loading coal in a place, he must hang his own check on each car loaded, and in addition to his own check he must hang the machine-runner's and the hostler's checks on the first two or three cars he loads from that place. It may be well to continue to do this for the first two or three days, or until the weighboss is familiar with the proper combination.

A good plan for the weighboss to follow is to note both the machine-runner's and the hostler's numbers at the top of the column for each miner working in their section and loading the coal they cut and haul. At the end of the day's run the weighboss carries the footing of each miner's coal to the corresponding machine-runner's and hostler's columns and prepares the bulletin for the next day.

It is of course understood that as quickly as the weighboss is familiar with each miner's combination, it is only necessary for the miner to hang his own check number on each car loaded as long as there is no change of machine runner or hostler. However, if the miner is transferred to another section or a new runner or hostler appears, it will be at once necessary for the miner to hang their checks on his car, together with his own, as at first, in order to indicate such changes, for the information of the weighboss and the proper accounting of the coal. The system is not as complicated as may appear from this explanation. L. J. M.

Harlan, Ky.

The Efficient Fireboss

Letter No. 21—Having read all the letters written on this subject and having filled many positions, from trapper boy to mine foreman, in 20 different mines in western Pennsylvania, I am led to say that no man can understand what a fireboss has to contend with and judge correctly of his work unless he has filled that position himself for a considerable time under different conditions and with different foremen. Conditions in no two mines are alike, and it is not strange that a discussion of this kind brings out many different ideas as to what constitutes a good fireboss.

What often causes the fireboss much anxiety is the disposition of his mine foreman to question his work. The marking off of one or more places that the fireboss considers dangerous means the loss of a few cars of coal, which worries the foreman, and he is apt to minimize the danger and criticize the fireboss for marking out those places. With few exceptions the mine foremen in this state have served their time as firebosses, but too many men when advanced to a higher position appear to consider themselves infallible and often expect the fireboss to accept their judgment, ignoring the fact that the law makes him responsible for the results in case of accident.

While acting as fireboss, I have frequently been up against these conditions. As mine foreman, I always advise my firebosses to err on the safe side, which will save a lot of trouble. I find that this promotes harmony and good will, as the fireboss is encouraged by the confidence placed in him. While his work is dangerous and often discouraging, it helps him to know that his efforts give satisfaction. The few cars of coal lost at times are more than compensated for by the energy and spirit with which the fireboss performs his work.

It is important to remember that a man who has not an iron will to back his judgment is an actual menace to safety, as such a man will permit his judgment to be set aside by anyone in authority over him; and, as a result, there is no protection afforded the workers, which the law has sought to provide.

In closing I want to emphasize my belief that the efficiency of a fireboss depends greatly on the way in which he is treated and his judgment accepted by the foreman. This also affects the discipline he is able to maintain among the men working in his section of the mine. Like one's own children, the firebosses in the mine are often largely what the mine foreman makes them.

Ernest Krause,
Asst. Mine Foreman, No. 1 Mine.

McDonald, Penn.

Letter No. 22—Reading the numerous letters relating to the efficiency of a fireboss leads one to conclude that the writers have generally ignored or overlooked what is, in my opinion, the chief drawback to efficiency of both mine foremen and firebosses. I refer to the fact that the actions of these men are dominated by parties higher in authority whose single idea is profit in operation. This is, of course, wrong and often proves tragic in a way of which the general public is not aware.

The fireboss is or should be preëminently the safeguarder of men's lives. A mine inspector paid by the state, in fulfilling his duties to the miner and the people at large, performs the selfsame service as the fireboss, but at a vastly superior salary. Moreover, he acts without fear of losing his position, but the same cannot be said of the fireboss. And yet, the latter's freedom of action is more vital to the health and safety of the men in his charge than is the mine inspector's.

Work of Mine Inspector and Fireboss Similar

Under the conditions that prevail at present, say in Pennsylvania for instance, the mine inspector visits and examines a given mine once in an interval of time varying, to my knowledge, from a few weeks to several months, while the fireboss and the mine foreman must perform the same service at the same mine every day when the mine is working. I will leave the reader to form his own opinion, as I have formed mine from long experience, in regard to the adequacy of the pay the fireboss receives for his services.

Neither will I attempt to answer the question as to whether this official, who is certified by the state in respect to his capability as is the state mine inspector, should be handicapped in his work by the fact that he is paid by the mine operators. His dependency, in this respect, no doubt obliges him to conform his acts to their wishes. He

is thus a unit in a great organization having for its chief purpose the creation of profit in the mining of coal.

Let me assume, for a moment, that the man is in reality an "efficient fireboss," by which I mean that he fully understands his duties and responsibilities and is willing to live up to them if permitted to do so. We will assume that from boyhood he has worked in the mines and is familiar with gas and coal dust and the dangers of bad roof. Assume, also, that he has passed the state examination and is qualified by practical experience and knowledge of mining conditions and practice to give efficient service if permitted freedom of action. He is able to detect the presence of gas and knows when a place is unsafe for work and must be fenced off until the danger can be removed.

Serious Alternative Fireboss Must Often Face

In short, this man is a sober, industrious, careful and competent official—an efficient fireboss. Now, let me ask, Can he retain his efficiency when face to face with the alternative of losing his position or sacrificing his judgment? His duty to his family requires him to do everything possible to retain his place, but the demand for increased output and decrease of expense to enable larger returns on the investment will often call for a compromise of judgment and make him assume greater risks than he would otherwise do willingly.

Given a larger territory than he can examine thoroughly in the allotted time, he is forced to slight certain places and assume that their condition is safe. Other places that he knows should be condemned and stopped for a time at least are permitted to continue because the coal coming from those places is badly needed. It may even be assumed that the man has sufficient courage to stop the places, but the pressure from those in authority is so strong that he is overruled and forced to yield. Though knowing better than anyone else that the danger is imminent, he still hopes for the best and, while watching these places closely, he must neglect other parts that he knows require attention.

For the purpose of further increasing the gains of the company, the fireboss is expected to hunt up materials, rails, timber, etc., that have been carelessly thrown aside in the waste. The saving of this material is vital to the company's interests, and as the fireboss is in their employ and they pay for his services, he must needs devote much of his time to this work which would otherwise fall to another. Thus the conditions in respect to safety in the mine are made subordinate to increasing the dividends of the company.

Duty of State To Protect Fireboss

Before leaving this phase of the subject, let me ask if the state, having certified to this man's qualifications in respect to his physical, technical, practical and moral qualities, performs its whole duty to the people when it leaves the man to shift for himself and affords him no protection from conditions that he is helpless to oppose.

In closing, I will refer briefly to the more problematic and variable aspects of the case mentioned by Edward H. Coxe and others. From Mr. Coxe's "experience gained in several different states," it is reasonable to suppose that he knows that a fireboss would find the task more arduous to examine thoroughly a hundred places in one mine than it would be to examine double that number in another mine. I have acted as fireboss in extremely gaseous and dusty mines, under dangerous roof where it would require two or three splendidly efficient, strong-legged and strong-backed firebosses to thoroughly safeguard every man's life in one-half of the "12 mi." of travel underground, which Mr. Coxe mentions as not being "such a terrible day's work" in his occupation.

Permit me to say that I have firebossed more or less efficiently in mines where nine-tenths of the chambers and entries required no examination, and the work there necessarily took on a perfunctory character. This was an exceptional case, however, the mines being located in a nongaseous field where, a slight trace of gas having been found in some heading when driving into virgin territory, the state inspector compelled the company to employ the services of a fireboss.

The instance cited differs widely from that of a mine where not a single room, cave-in, rib or entry may be passed by with impunity, but each place requires a careful and regular examination by the fireboss in a way that cannot be done in a 12-mi. tramp in a single shift, much less in the three hours allotted to the fireboss. In this latter case, the ever possible and probable penalty for a single omission or neglect may be the loss of scores of lives and the destruction of a plant. While the fireboss may act as a dividend chaser with perfect impunity in the first case mentioned, he must make a careful and thorough examination of every place in the latter instance, and that for the "efficient fireboss" is *firebossing*.

James T. Reynolds,
Houston, Penn. Mine Inspector.

An Efficient Coal Miner

Letter No. 1—Among coal miners the truly efficient miner is hard to find when the full meaning of the term is considered. I believe that a little discussion along this line will cause many well-meaning miners to sit up and think more seriously of the numerous little things required of them, which too many ignore at present.

An efficient miner is one who regards everything that pertains to his own safety and that of his fellow workers, as well as performs his duties in a workmanlike manner and avoids any undue waste of coal or material sent into the mine. He is a man that obeys strictly both the mining laws and the instructions of his mine foreman.

Let me describe such a man briefly as he starts on his daily routine. He goes to the mine with a clear head, changes his clothes at the wash house and, taking his life check from the board at the mine entrance, waits his turn to step on the cage when ordered. He does not rush forward in an attempt to be the first on the cage. In the same manner, on reaching the bottom, he waits until the cage comes to rest before stepping off onto the landing. In so doing, he avoids the accident that befell a man I once knew, who stepped off the cage before it landed and slipped and fell, striking his chest on his dinner bucket and injuring himself badly.

On reaching his working place the efficient miner first looks for the mark of the fireboss, showing by its date that the place has been examined that morning and is safe for work. Not relying wholly on this fact, however, he examines the roof and the sides and face of the coal to assure himself that the place is safe. He then sets any timber that may be needed to secure a loose piece of top. When loading his coal, he throws out bone and other impurities and sends up cars of good clean coal.

In preparing to blast the coal he locates, drills and charges all holes with the greatest care, using his best judgment. He will not drill a hole beyond a loose end or cutting, so that the powder will have a good chance to perform its work. An efficient miner will never leave a shot to be fired by a shotfirer when he would be afraid to fire the same shot himself. He takes every precaution required in preparing a shot, tamping the hole with fireclay or road dirt, removing all fine coal and dust produced by drilling and seeing that the place is otherwise safe for firing. He fires only in his turn and after giving sufficient warning to the men in adjoining places.

On leaving the mine he takes with him his tools that require to be sharpened and leaves them at the shaft bottom or at the blacksmith's shop. What material he may need for the next day he orders, specifying the size and length of props, number of caps or rails, etc. He is careful to order what timber he needs, so as to always have a sufficient supply on hand at the face of his room, ready for use in case of emergency. A good miner will not work in a place that needs timbering when the timber ordered is not on hand. Many a miner has been fatally injured or killed by taking a chance and proceeding to load his cars before setting the necessary timber to make the place safe.

Universal, Ind. JACOB RILEY.

Detecting Gas by Smell

Letter No. 15—I have been greatly interested in the many practical discussions in *Coal Age,* and particularly in the question of detecting gas by its odor.

Many times, through some unaccountable sense, which I naturally ascribe to that of smell, I have detected the presence of a body of gas about me before noticing any indications of its presence on the lamp. On such occasions the gas would always prove to be in a nearly pure state when discovered. It was not traveling in the air current but stratified above the current, which was passing beneath in its usual volume.

On other occasions I have been able to detect gas traveling with the air when I have been walking against the current. This seemed to me to be due to the smell of the heated gauze, the latter giving off a very disagreeable and pungent odor. On halting and making a test for gas, by protecting the lamp from the current, I have discovered various percentages of marsh gas present and, by the action of the flame, have suspected the presence of the heavier hydrocarbons, olefiant gas and ethane.

EVIDENCE OF YORKSHIRE MINERS

In conversation with some practical miners who had worked in the gaseous mines of the Yorkshire district, England, where the longwall method of mining is employed, I am told that gas is readily detected by its odor on numerous occasions, especially on top of falls and in potholes in the roof where it has accumulated. I have often wondered why this peculiar sense of smell is so manifest, in the mines, when we are taught that marsh gas is "odorless." I have been wont to attribute the claims of miners in this respect as largely the result of imagination on their part. However, my own experience has led me more recently to change my mind and made me believe that marsh gas, as it occurs in mines, has an odor.

Another feature that I have noticed in this connection, which seems to me a peculiar one, is that when one's face or head is in contact with a body of this gas, there is felt a cool sensation, which is more noticeable after any undue exertion and when a person is warm and perspiring. I have noticed this effect many times when trying to clear gas out of a place and have raised my head into the roof when erecting a canvas to deflect the air upward. On these occasions I have experienced a feeling of dizziness, and the voice sounds to oneself as if it came from a distance. This cooling sensation has seemed strange to me, as I have always understood that an outburst of gas is accompanied by a rise in temperature due to the outflow of the gas from the strata.

SMELLING GAS IN DRY OR WET PLACES

In regard to dry and wet places, I have not noticed whether this condition has any effect to make the odor of the gas more or less perceptible. There is usually some slightly offensive odor given off in a wet mine, especially if the mine air is warm. I would say, therefore, that if gas can be detected by its odor more readily in one place than in another, it would be most quickly perceived in dry workings where the offensive odor I have mentioned is not present.

Permit me to say that I have observed a distinct difference in the flame cap of marsh gas when the mine air has a high humidity, as compared with the same indications in a dry air. EDWIN C. CURTIS.

Nanticoke, Penn.

Opening Shaft Mines

Letter No. 1—In the article on this subject by M. L. Hyde, *Coal Age,* May 27, p. 910, which I read with much interest, time and economy are mentioned as important factors in the opening of a new mine. Keeping these points in view, it appears to me that there are several undesirable features in the general plan outlined in the article.

While the minimum distance of 500 ft. between the two main shafts, recommended by Mr. Hyde, is desirable on some accounts, it must be remembered that this plan entails extra time in establishing connection underground when time is an all-important factor to be considered. Also, the shaft is removed to a point where it would be inconvenient to make use of it for hoisting material of any kind, should occasion demand. To these objections must be added the extra expense of driving the underground connections between the two shafts and establishing suitable drainage for both. Locating the two shafts at this distance apart also needlessly spreads out the surface equipment over a considerable area, a fact that I believe Mr. Hyde has not hesitated to condemn in previous articles.

Speaking of gravity bottoms, Mr. Hyde remarks, "Feeders are unnecessary where scales are not employed, the cars being then brought directly to the cages." In my opinion the loaded-side feeder chain is a needless complication, even where weigh scales are in use in the mine. The operation of a feeder chain is necessarily of a precise character, requiring to be started at the moment a car is uncoupled and the chain stopped. At the present time I am operating a gravity bottom, where trips run in at a fairly high speed and are caught in a car-stop consisting of rubbing timbers worked by a lever. From this the cars are readily released and spraggers are not required as in Mr. Hyde's arrangement.

Again, the chain-haul on the empty gravity-type bottom, in Mr. Hyde's plan, works under bad conditions since it has to start up the dead load of a large trip for each car delivered. The scheme for handling rock does not appear at all satisfactory, as the bulk of these rock cars usually come out early in the day filled with rock and track cleanings loaded on the previous night shift. It certainly cannot be claimed that all rock will come out in a single complete trip, as rock from machine cuttings, entry brushings, etc., may be sent out at different times through the day. This will complicate the switching arrangement necessary to separate the rock cars from the coal, and much loss of time and system will result.

To provide the necessary storage room another mine track will be required, but what is of more importance, valuable equipment will be tied up by reason of the cars standing idle. Evidently, however, Mr. Hyde has not considered this matter seriously, since he provides 130 cars having a capacity of from 2 to 4 tons for an output of 360 tons of coal a day. Permit me to suggest that, with a properly designed screen, there is no reason why a car of rock cannot be disposed of on the tipple as quickly as a car of coal and returned at once to the mine to be loaded again, instead of standing idle for a time.

In locating the miners' lamproom underground, it is evidently assumed that there is no combustible material associated with the lighting arrangements, since one of Mr. Hyde's objectives is protection from mine fires. There would be considerable objection to the charging of storage batteries on what seems to be the intake airway. On the whole, I cannot see that there is anything to be gained by placing a lamproom in the mine, either in respect to safety, economy, speed or convenience.

Referring to the suggestion of the use of steel timbering and steel ties for the support of roof and sides on a shaft bottom, to render it "practically squeeze proof, fireproof, permanent and easily maintained," I want to say that it has come to be generally understood that brick or concrete walls offer the best solution for shaft-siding work. Perhaps Mr. Hyde can explain the particular advantages that he considers will be derived by the use of steel timbers and ties in this case.

Mr. Hyde further suggests that "steam jets should be placed at the foot of each shaft so that in freezing weather either or both may be cooked during the night." In this part of the country, where the temperature frequently falls to 60 deg. below zero, such a provision would be useless for that purpose. Furthermore, the legal requirements in this province would not admit of suspending ventilation during the "cooking" process, which would be necessary at least in the downcast shaft.

Perhaps, however, Mr. Hyde intends to reverse his ventilation when cooking that shaft. In that case it may be assumed that the main haulage road in the mine could be safely operated as a return airway and, if so, freezing in the shaft could be easily prevented without the use of a steam jet, by simply reversing the circulation. This result could also be accomplished by introducing heating coils in the downcast shaft instead of reversing the current. I operated a wet shaft during the whole of last winter, which was exceptionally severe, by passing the air through coils heated by the fan exhaust, before conducting the current into the mine. This article seems to be inconsistent, with the author's previous articles.

Edmonton, Alta., Canada. LEONARD C. STEVENS.

Siphon Line in a Mine

Letter No. 3—I was greatly interested in the inquiry that appeared in *Coal Age,* May 13, p. 858, in regard to laying a siphon line in a mine. Like the writer of Letter No. 1, June 24, p. 1101, I believe the answer that was given to this inquiry is correct for determining the quantity of water that will flow through the siphon under any assumed conditions. Like that writer, however, I have laid many siphon lines in mines and have learned by long experience that their successful operation is greatly assisted when a few practical points are carefully considered.

First, the line of pipe should be as straight as possible, and when it is necessary to round a corner in the mine a short section of curved pipe should be used. Always avoid the use of elbows and valves in a pipe line, except where these are absolutely necessary. In my experience I have found air valves for the escape of air to be unnecessary, unless the pipe is 4 in. or more in diameter.

In charging a siphon I have always used a pump, making the connection between the pipe line and the pump as close to the edge of the water as possible. When necessary a reducer can be used to make this connection, but this will not be required if the pump connection is of the same size as the tee in the pipe line. The pump, of course, has its own suction pipe. I usually find it an advantage to use a small swing valve at the suction end of the siphon, but care should be taken not to have this valve submerged too far below the surface of the water, as it is then difficult to free the valve in case it becomes clogged or obstructed, which is apt to happen. There should be a good gate valve in the connection between the pump and the pipe line. Clay can be used to make the pump connections tight, in case they leak.

In laying a siphon line, it is well to avoid, as far as possible, rises at different points in the pipe. It is not always possible to do this, but it can often be done by raising the pipe in low places in the entry. The best results are obtained when the pipe line has a single summit, or high point. Where rises are unavoidable in the pipe line small air holes or vents closed by a wooden plug should be provided at such places. It has been my custom to use a sleeve plugged with wood to prevent the water flowing out at the discharge end while charging the pipe.

At times I have been troubled with the siphon running empty in from three to five days, which I have thought was due to the blocking of the pipe, either by some obstruction or by corrosion, so that its area was much reduced. In such cases, by using a reducer at the suction end of the pipe, I have been able to overcome the difficulty and keep the pipe running. Owing to the corrosive action of most mine waters, the clogging of a pipe line is a common experience. Therefore it is important in laying a siphon in a mine to see that the pipes are all clear and free from any dirt or other obstruction. A pipe line should never be laid where other water will flow over it, as this will hasten the corrosion of the pipe. Also, because of the sweating of a pipe line, it is well to protect it from accumulations of dirt, which will start corrosion and destroy the pipe. Of course all pipe joints should be made tight. There are many other points that can be learned only by practical experience.

Spangler, Penn. ELMER FULTON.

Inquiries of General Interest

Thickness of Mine Dam

In one of our collieries the workings were approaching those of an old abandoned mine, of which no accurate survey had been kept and the only map available gave evidence of its unreliability. For this reason a single heading was driven well in advance of the working face and drillholes were bored both in the face and the ribs of the heading. The old mine was known to contain a considerable quantity of water, on which account it was impossible to make another survey and locate more accurately the extent of the old workings.

Under these conditions I want to ask what would be the safest method of procedure and what course should be adopted to insure the safe working of the mine? The seam is practically level and lies at a depth of 300 ft. below the surface. If a dam is to be built in the heading, kindly describe how this should be done, and what should be the thickness of the dam to withstand the maximum head of water. H.

Pittston, Penn.

The work of driving toward abandoned workings known to contain much water is always attended with danger. In this case, since the seams are level, it would be advisable to pump the water from the shaft of the old mine so as to lower the head and thus decrease the pressure of the water. It will only be necessary to pump the water from a single shaft, as the water level will be lowered an equal amount in each of the other shafts, provided there is no obstruction in the entries that would prevent the free flow of the water through them. It may not be possible to drain the water from the entire mine, especially if the workings are extensive.

The single heading being driven in advance of the new workings should not exceed 10 ft. in width. At least one borehole should be kept from 6 to 10 yd. in advance of the face of the heading. Also, flank holes should be drilled in each rib 20 yd. apart and inclined forward at an angle of about 45 deg. with the center line of the heading. A constant watch must be maintained to observe the first signs of any increase in the seepage of water through the strata, which would indicate a more or less close proximity to the old workings. Safety lamps should be used at the face of the heading and wooden plugs kept in readiness to stop the mouth of a drillhole whenever it breaks into the flooded district.

Assuming that a borehole has tapped the water and the mouth of the hole been tightly plugged so as to stop the flow of water, if it is thought best to build a dam at the face of the heading to afford further protection, the work should be commenced by cutting into the roof, floor and ribs so as to provide good bearing surfaces for the dam. The bearing surfaces should be stepped in the ribs of the entry and these should be cut at an angle corresponding to the radius of the curvature of the dam. The radius of the outside face of the dam, or the shorter radius should not be less than the width of the opening and may be preferably made from 1.5 to 2 times that width. For example, the radius for a heading 10 ft. wide should not be less than 10 ft. and may be from 15 to 20 ft. in length.

The thickness of a cylindrical dam measured radially is best calculated by the formula

$$t = \frac{3pw\sqrt{4r - 1}}{S_c}$$

in which t = thickness of dam (in.); p = pressure of water behind dam (lb. per sq.in.); w = width of clear span (ft.); r = shorter radius of dam (in.); S_c = safe crushing strength of material (lb. per sq.in.).

For the purpose of estimate the ultimate crushing strength of a 1:3:6 concrete, after one month, may be taken as 1,800 lb. per sq.in. and, using a factor of 3, the safe crushing strength is 600 lb. per sq.in. The maximum pressure for a head of 300 ft. is 300×0.434 = say 130 lb. per sq.in. Then, for a width of 10 ft. in the entry and a radius of, say 15 ft. or 180 in., the required thickness of a concrete dam will be

$$t = \frac{3 \times 130 \times 10\sqrt{4 \times 180 - 1}}{600} = 175\ in., or\ 14\ ft.\ 7\ in.$$

Suggestion in Shaft Hoisting

I want to ask some of the competent readers of *Coal Age* who have had experience in hoisting large outputs from mine shafts, Why is it that double-deck cages are always operated by signal from bottom to top of the shaft when it is required to change the cage in order to load the second deck? Why has no attempt been made to devise a means by which the cage can be changed by the cager at the bottom without signaling the engineer on the surface? Could not this be accomplished by the use of hydraulic power?

For example, the cager having pushed the loaded car onto the lower deck, would it not be possible to devise an apparatus by means of which he could lower the cage himself, so as to run another loaded car onto the upper deck before signaling the engineer to hoist? Of course, this would require that the engineer, when landing the cage at the bottom, give sufficient slack to the hoisting rope to enable the cage to be lowered by the cager when desired, so as to bring the upper deck to the landing. I would like to see in *Coal Age,* an expression from practical mining men as to the feasibility of this scheme, which seems good to me.

Peru, Ill. GASTON LIBIEZ.

Coal Age will be glad to receive an expression of opinion from its readers on this proposed scheme for operating a double-deck cage. The question to be discussed is, Does the scheme possess any practical advantage, and if so, how would it be possible to operate the cage in the manner suggested? Would there be danger of breaking the rope when the engineer started to hoist the cage, by reason of having given too much slack to the rope?

Examination Questions

British Columbia Examination, First Class, May 30, 1916

(Selected Questions)

Ques.—A borehole from the surface to the workings in a mine is 6 in. in diameter, and the mixture containing 50 per cent. of methane (CH_4) and 50 per cent. of air is passing up this hole with a velocity of 130 ft. per min. What is the volume of the flow in cubic feet per minute, and what will be its volume if sufficient air is added to bring the mixture up to the highest explosive point?

Ans.—The sectional area of this borehole is $0.7854 \times 6^2 = 28.27$ sq.in. The volume of the flow of air and gas in the hole is then $130 \times 28.27 \div 144 = 25.52$ cu.ft. per min.

Since the mixture contains 50 per cent of gas, the volume of gas flowing from the borehole is $\frac{1}{2}(25.52) = 12.76$ cu.ft. per min. But a mixture of methane and air at its most explosive point contains 9.46 per cent. of gas. The total volume of gas and air passing in the borehole under this condition would then be $12.76 \div 0.0946$ = say 135 cu.ft. per min.

Ques.—To what extent are the following gases soluble in water: Carbon dioxide, hydrogen sulphide and marsh gas?

Ans.—At the ordinary temperature of the mine, water absorbs its own volume of carbon dioxide and three and one-quarter volumes of hydrogen sulphide. Methane is very slightly soluble in water, three volumes of the gas being absorbed by eighty volumes of the water.

Ques.—What is the highest percentage of explosive gas in which you would deem it safe to carry on blasting operations in mines?

Ans.—Much will depend on the character of the coal, the kind of powder used and the manner of blasting. Where the coal is hard and does not make much fine dust and is not particularly inflammable, and where permissible powders are used, blasting may be safely conducted in the presence of 2 per cent. of gas, provided the shot is a safe one and the place is previously examined so that no accumulation of gas is permitted at the time of firing. On the other hand, where the coal is highly inflammable and makes much fine powder, especially in a hot or dusty mine, or in contracted workings, or where black powder is used and not sufficient care is employed in placing the shot and charging and tamping the hole, blasting becomes dangerous in the presence of less than 1 per cent. of gas.

Ques.—Are you in favor of mixed lights in mines where explosive gas is being generated? Give reasons in full.

Ans.—A mine generating explosive gas should either be worked exclusively on safety lamps or the ventilation should be such as to enable open lights to be used in every portion of the mine. The use of mixed lights in mines cannot be regarded as safe practice and should never be tolerated. Even where gas is generated in a single section of the mine only and safety lamps are required in that section, the use of open lights in other portions of the mine is an element of danger. The reason is that an open light is liable to be carried into the safety-lamp section, inadvertently, or carelessly, or through ignorance. Again, a large outflow of gas may occur, or a heavy fall of roof in that section may drive the gas out into other portions of the mine where open lights are used. These possibilities are entirely avoided where all sections of the mine are treated alike, or the mine is worked exclusively with one kind of lamp.

Ques.—How would you determine the quantity and percentage of gas in mine air?

Ans.—The percentage of gas present in an air current flowing in an airway should be determined by a gas indicator that will show the percentage of gas present with accuracy, the most convenient form being the Beard-Mackie sight indicator. It is necessary to take a number of readings in different parts of the cross-section of the airway so as to obtain a fair-average reading for the airway. Reliance should not be placed on estimating the percentage of gas by guessing at the height of the flame cap.

To ascertain the quantity of gas present, multiply the volume of the current (cu.ft. per min.) by the observed percentage of gas present. The product will be the volume of gas in the air current, in cubic feet per minute.

Ques.—Taking the weight of a cubic foot of air in the downcast shaft as 0.08 lb. and that in the upcast shaft as 0.078 lb., what will be the water gage if the shaft is 160 fathoms deep, and what is the motive column?

Ans.—Assuming that the two shafts have the same depth and that the surface is level, the difference in weight of air per cubic foot in the two shafts being $0.08 - 0.078 = 0.002$ lb. and the depth of the shaft being $160 \times 6 = 960$ ft., the difference in weight of the two shaft columns is $960 \times 0.002 = 1.92$ lb., which is the unit ventilating pressure resulting from the difference of weight in the two shaft columns, or the pressure per square foot producing circulation. This corresponds to a water gage of $1.92 \div 5.2 = 0.39$ in.

The motive column can be expressed in terms of either the downcast or the upcast air and is found by dividing the unit pressure, expressed in pounds per square foot, by the weight in pounds, of a cubic foot of the air. Thus the motive column in terms of the downcast air is $1.92 \div 0.08 = 24$ ft.

Likewise the motive column in terms of the upcast air is $1.92 \div 0.078 = 24.6$ ft.

Ques.—How should the outlet of an exhaust fan be arranged so as to allow the air from the mine to be discharged freely?

Ans.—To give the highest efficiency an exhaust fan of the centrifugal type should be provided with a spiral casing surrounding the fan wheel and terminating in a gradually expanding chimney thereby reducing the velocity of discharge to a practical minimum.

Coal and Coke News

Washington, D. C.

Coal rates on various branches of the Oregon Short Line R.R. and connections from mines in Wyoming are to be revised to conform to the so-called fourth section of the act to regulate commerce, according to orders recently entered by the Interstate Commerce Commission. This section requires the railroads to apply rates to the intermediate points not higher than the rate to the terminal point. The Oregon Short Line was directed by the Commission to apply this rule strictly in connection with the rates on coal from Wyoming mines to Garfield, Utah, as appearing in the roads tariff, I. C. C. No. 1677; on coal from the same mines to other Utah points as appearing in tariff I. C. C. No. 1617, and on coal from the same mines to Idaho points as appearing in tariff I. C. C. No. 1698. In all three instances the order of the Commission is to take effect on Jan. 1, 1917.

A decision favoring the complainant has been entered by the Interstate Commerce Commission in the case of the Poteau Coal and Mercantile Co. against the Abilene & Southern and other railroads. In this case the complainant asked for the reinstatement of joint rates on coal from Witteville, Okla., to points in Texas and other states which had been canceled by the defendants, and for reparation. The defendants voluntarily restored the joint rates, but opposed the claims for reparation. At the hearing certain carriers asked the Commission to determine whether the Fort Smith, Poteau & Western Railway Co., which served the complainant's mine at Witteville, is a common carrier, and, if so, to fix divisions of the reinstated joint rates.

The Commission held that the rates under attack were unreasonable in the amount that they exceeded the joint through rates formerly in effect and reparation was awarded accordingly. The Commission also held that the Fort Smith, Poteau & Western Railway Co. is a common carrier, but the question of divisions was left for further consideration.

A fourth-section order has been entered by the Interstate Commerce Commission granting the application of the Chicago, Milwaukee & St. Paul R.R. for permission to continue the rates on coal and coke from Duluth and Superior without observing the long-and-short-haul restrictions. The order stipulated: "That the petitioner herein be, and is hereby, authorized to establish a rate on hard coal and coke, carloads, from Duluth, New Duluth and West Duluth, Minn., and Superior, Wis., to Linton, N. D., the same as the rates contemporaneously in effect on like traffic from and to the same points via the more direct line of the Northern Pacific Railway Co.; and to maintain higher rates to intermediate points, provided that rates to the said intermediate points shall not exceed $3.60 per ton of 2,000 lb., and that the present rates to the said intermediate points shall not be exceeded."

The petition of the same road as regards the coal rates from Menominee and Marinette was also granted. This order stipulated "that the petitioner herein be, and is hereby, authorized to continue a rate on soft coal, carloads, from Menominee, Mich., and Marinette, Wis., to Stiles and Stiles Junction, Wis., the same as the rate contemporaneously in effect on like traffic from and to the same points via the more direct line of the Chicago & Northwestern Railway Co.; and to maintain higher rates to intermediate points south of Beaver, Wis., provided that rates to the said intermediate points shall not exceed 75c. per ton of 2,000 lb."

HARRISBURG, PENN.

Chairman Mackey, of the Workmen's Compensation Board, has evolved a principle in the payment of compensation that will probably stand permanently for the future guidance of the Board. In an opinion on July 19 he declines to sanction the lump payment of $6,015 to the widow of Harry Stifura, of Allegheny County, killed while working for the Pressed Steel Car Co. She and three children are entitled to that amount in semimonthly payments, covering a period up to 1931, but she asked that the money be paid at once so she could make a certain investment and the company agreed to pay it. The commission holds that it is well to protect her against herself and an uncertain investment. Her petition was refused, and the payments will be made as the law prescribes.

The opinion says:

These petitions for commutation come before us under Section 424 of the workmen's compensation act. It will only be in rare cases that we can wisely exercise this discretion by granting such petitions. It is a great temptation to a widow, or any beneficiary under this law, to ask that the compensation payments be commuted to present value and paid in a lump sum. We think, however, in a great majority of these cases these petitions are ill-advised and a real wrong would be done to the petitioners if we granted their prayers.

This act has wisely provided for the payments of compensation to be made at such times as the injured or deceased would have received his pay, thereby providing a certain, modest but sufficient sum, at stated intervals so as to relieve the dependent of real want.

In the majority of these cases the dependents have been unaccustomed to the use of money in bulk and the sudden acquisition of a considerable sum might readily lead to its unwise expenditure or to its unfortunate investment. The widow might terminate her dependency by remarrying, and then the money would probably be spent without regard to the rights or best interests of the children.

As a general rule, we are opposed to granting such petitions to alien citizens who are desirous of taking the money to foreign countries. Awards have been made on the basis of the residence here. This same amount of money in a foreign country would be worth more than it is here, hence the difference in the act in the amount to be awarded to alien dependents; not that our Legislature intended to discriminate against this latter class, but it attempted to equalize money values beween foreign countries and ours.

We desire by this opinion to apprise the public that it will only be in exceptionally meritorious cases that we will grant commutation.

Luzerne County Court Reversed

The Superior Court of Pennsylvania has reversed the Luzerne County Court in the Commonwealth vs. Jones, a former assistant mine foreman for the Lehigh Valley Coal Co., who will now have to undergo trial in the criminal court on a charge of receiving money from a workman to insure the latter employment.

This case attracted considerable attention, it being alleged that Jones received from a foreigner of West Pittston $5 for the purpose of continuing the foreigner in his employ. The prosecution was begun by Miss Emily Johnson, a settlement worker of West Pittston, the charge being that the action of the mine foreman was in violation of the act of June 15, 1897.

On Feb. 21, 1916, Judge Strauss, by opinion, quashed the indictment, holding in effect that a mine foreman was not an employer of labor within the sense of the law, but was an employee himself. The judge classed the law as slipshod legislation, and stated that "an attempt to apply it to the actual operation of mines shows that this criminal statute, which must be strictly construed is futile and unworkable by reason of the fact that it has left out the universal conditions of employment of the miners by the mine foreman's superior and not by the foreman himself."

The District Attorney appealed from the decision to the Superior Court. The latter has reversed the ruling of the local court which means the indictment is reinstated.

In the argument before the Superior Court it was pointed out that the acceptance of money for a job was a pernicious practice that preys upon the ignorant foreigner seeking employment, and undermines the faith of non-English speaking people in this country. It was also argued that both the mine workers and the operators were interested in this sort of legislation, and it was on this account that the Commonwealth took the appeal.

What Are Major and Minor Operations?

The difference between "major" and "minor" surgical operations under the workmen's compensation act will probably be decided by the Board, at a meeting to be held the latter part of this month. The opinion of eminent surgeons have been sought, and Dr. Francis D. Patterson, chief of the State Division of Hygiene, assisted by a committee of experts, has offered a comprehensive definition, which the Board will consider at its meeting.

Under the act the medical expenses granted for the first 14 days may amount to $25; or if there has been a major operation, $75. It has seemed to those administering the act that every operation has tended to be a "major" rather than a "minor" one. The question has puzzled referees, and no surgeon would hazard an opinion as to what was a major and what a minor operation.

To obviate further misunderstanding the Workmen's Compensation Board appealed to Dr. Patterson for an official definition. In framing the definition Dr. Patterson was assisted by five surgeons as follows: Dr. John M. Baldy, president of the Bureau of Medical Education and Licensure of the state; Dr. J. B. McAllister, president of the state Medical Society; Dr. W. L. Estes, surgeon to St. Luke's Hospital, South Bethlehem; Dr. Robert G. Leconte, surgeon to the Pennsylvania Hospital and Dr. Edward Martin, professor of surgery at the University of Pennsylvania Hospital.

As so defined a major operation is "(1) a surgical procedure which entails immediate serious consequence to the patient; (2) it is surgical procedure which requires skill and training to perform; (3) all operative procedure other than finger and toe amputations, cleansing, draining and closing wounds, evacuating secretions by incision, the manipulating and reduction of uncomplicated dislocations, the treatment of uncomplicated fractured ribs, the removal of superficial foreign bodies from the eye and the removal of subcutaneous foreign bodies should be regarded as major operations."

The term major operation would include "setting fractures of long bones and reducing subluxations, providing accuracy and efficiency of reduction and retention be demonstrated by X-ray taken before and after surgical treatment."

The report of this body of surgeons also embodies the suggestions that all fees and charges for major operations should be limited to such charges as are reasonable for similar treatment of injured persons of like standard of living in the same community where such treatment is paid for by the individual person.

Desired Amendments

Amendments to the Compensation Act will be sought at the next session of the Legislature, by union organizations of the state. That under the present act much relief work has been accomplished, is acknowledged by labor leaders. They claim the act is entirely satisfactory in its basic principles to the union men, but they seek an extension of the benefits derived so as to conform with the laws of other states.

In Pennsylvania 14 days of disability are required before the dependents are eligible to compensation. The legislators will be asked to reduce this to three days, the same period as in New York State. The period of compensation is 300 weeks here. In New York State it is 500 weeks, and the longer period will be sought for this state.

PENNSYLVANIA

Anthracite

Tamaqua—Joseph Kellert, a miner in No. 2 colliery of the Lehigh Coal and Navigation Co., was rescued on July 22, after being entombed 32 hr. He was caught by a fall of top rock which blocked the gangway for 100 ft. He was rescued after a force had dug through 60 ft. of rock for him, and was none the worse for his experience.

Taylor—The Lackawanna Coal Co. has completed plans for reclaiming a big tract of coal land in the southwest part of the town by means of a stripping operation that will require the moving of about 1,300,000 cu.yd. The cost is estimated at between $200,000 and $300,000.

Shenandoah—Fire was discovered on July 20 in the William Penn culm bank, which it is said started early in the Spring when a cave-in occurred on the bank, taking the workmen's shanty, containing a stove into the mines. It was thought that the fire in the stove was smothered, but great was the astonishment among the officials and other coal company men to find the culm on fire. It is feared the fire has communicated to valuable veins of coal. Nothing is being left undone to conquer the fire.

Wilkes-Barre—On the 29th of July the Delaware, Lackawanna & Western R.R. will award prizes to the residents of Concrete City, its model mining settlement in Hanover Township, for the best kept flower and truck gardens.

Lansford—The Lehigh Coal and Navigation Co. has started operations to recover the fuel from the large culm bank on the eastern end of this town, and will entirely remove the bank, which is expected to take several years. The company just completed the removal of the large bank at the western end of the borough.

Bituminous

Seward—Practically all of the miners of the Ninevah Coal and Coke Co. have returned to work and the strike which lasted for several weeks is over. A compromise agreement has been reached.

Boswell—The new mine of the Standard Quemahoning Coal Co. is soon to be opened. The Standard plant is one of the largest in the vicinity, and is growing rapidly. A new railroad siding is being built, a new tipple is being constructed and modern machinery is being installed.

Indiana—One of the largest coal deals ever made in Indiana County will be closed shortly, according to a persistent rumor, when the Rochester and Pittsburgh interests will take over a field of more than 10,000 acres in the Jacksonville district from the Clearfield Bituminous Coal Corporation and the Kent Coal Co. Negotiations for the transfer of a large portion of one of the richest coal tracts in the county have been under way for two years and details are said to have reached a stage that assure the consummation of the deal in a short time. The securing of this tract will give the Rochester & Pittsburgh interests a solid block of coal territory in the Jacksonville field, which is being developed rapidly by operations at McIntyre, Aultman and Iselin. The price will approximate $1,000,000.

Connellsville—The Connellsville region is reported as operating 87 per cent. of its ovens at 90 per cent. of their capacity. The plants are working six days per week, but coke labor is more or less independent, and the men are not as eager to work as they might be. Production for the week ending Saturday, July 15, aggregated 418,016 tons, being a gain over the previous week.

Uniontown—As a result of a fire which destroyed the fan house at the mine of the Luzerne Coal and Coke Co. on the Monongahela River, the mine was shut down. It will be some time before a new fan can be installed, and the works will be closed until the injured machine is replaced. The actual loss was small.

Alleging that his farms have been greatly damaged by the removal of coal, John W. Work, of Dunbar Township, recently filed suit in trespass against the H. C. Frick Coke Co. Mr. Work alleges that with the removal of the coal his land has caved, and wells and springs have been destroyed. The damage extends to nearly 200 acres of ground.

Greensburg—First steps toward developing the Puckety Valley near New Kensington have been taken by the awarding of a contract by the Valley Camp Coal Co. for driving the slope and new shaft of a mine to be sunk near Parnassus. The cost of this work will be $30,000, and the mine will be the first big employer of labor in the Puckety Valley.

WEST VIRGINIA

Princeton—The Piney extension of the Norfolk & Western Railroad Co., which is to be about 6 mi. in length, is now under construction, and is to be completed by fall, ready for use by several new mines which are to be opened along it. The Stone Coal branch of the road has been completely laid with steel and coal operations on it are about ready to begin shipments.

Morgantown—The Milwaukee Gas Coal Co. recently purchased something over 1,000 acres of coal land in Fayette County. This will be operated by a concern known as the St. Clair Coal Mining Co. The property was purchased from the St. Clair Collieries Co., and also acquired by lease from the Mecca Colliery Co., the M. B. Coal and Coke Co., and the Gordon Coal and Coke Co.

Bluefield—Thousands of tons of coal that had been tied up in the local railroad yards and storage tracks in the Pocahontas field on account of floods and washouts recently started moving toward Lambert Point and other southern destinations. As soon as notice to release the coal trains was received, they were moved out as rapidly as possible.

Charleston—A recent fire in the drum house of the Four States Coal Co. operations at Dorothy destroyed the drum, causing a damage of $10,000. The origin of the fire is unknown, and none of the surrounding buildings were damaged. The fire had gained such headway before being discovered, that it could not be quenched. The loss is covered by insurance.

Fairmont—It is estimated that 10,000 workmen are needed in the Fairmont region immediately. The greatest need of laborers is in the mining industry. The mines are being handicapped in their operation because of an inability to secure miners.

ALABAMA

Birmingham—Great damage was done to mining properties in the Birmingham district by the recent high waters. The Palos coal mines of the Republic Iron and Steel Co., west of Birmingham, suffered a cave-in alongside of the Warrior River and every entry in the mines was filled with water. Several weeks' time will be necessary to pump this out. Edgewater coal mines of the Tennessee Coal, Iron and Railroad Co., also suffered damage by high water and ore mines on Red Mountain, below the city, were reported caved in by the incessant rains.

KENTUCKY

Whitesburg—In preparation for increasing the plant at Kona Station, in the Boone Fork coal field, the Elkhorn Coal Co. is building half a hundred new miners' houses. The Consolidation Coal Co. has just awarded contracts for the erection of 50 additional houses at McRoberts. A Y. M. C. A. building and churches will also be erected.

Lexington—Coal operators in eastern Kentucky, especially in the Elkhorn field, report a dearth of miners, which, with other causes, will result in a reduction in the month's production. Hazard in Perry County is also reported to be short of labor. J. W. Reed, assistant state mine inspector, recently reported that the situation is acute and mine operators are experimenting with mining machines to take the place of the men. Nearly 2,000 men are employed at the mines of the Consolidation Coal Co. at Jenkins and Mr. Reed said there is need for an additional 1,000. The company has been in operation steadily since Jan. 1 and made an effort to double the output of coal by Apr. 1, but failed for the lack of workers.

Harlan—Operators in the Harlan County coal field are taking preliminary steps looking toward organization of a county association, similar to that organized some time ago by the Hazard operators and like that of Franklin County, Illinois. Impetus was given the movement recently by C. M. Modderwell, former president of the Franklin County association and former president of the Illinois organization, when he addressed operators at Pineville as to the benefits to be obtained through coöperation.

INDIANA

Terre Haute—The coal industry of Indiana is facing a shortage of miners and cars. If the mine operators now had orders for a capacity output there would not be a sufficient labor supply and perhaps not more than two-thirds enough cars to handle it. Shortage of miners is attributed in part to the war, which has not only withdrawn miners but stopped immigration. In the past three or four years many English, Welsh and Scotch miners came to the Indiana field. It is reported that one road supplying mines has adopted a car conservation program by which mines are refused empties so long as 10 or more loaded cars are standing at the mines and are not billed out. It is reported that other railroads will shortly put a similar plan into effect.

ILLINOIS

Hillsboro—Mrs. Antonio Owasne recently came all the way from Austria to prosecute a claim against the Peabody Coal Co. under the Illinois Workingmen's Compensation act. When Owasne was killed in the Peabody company's Kortkamp mine in September, 1914, it was supposed that he was a widower. M. J. McMurray, public administrator, learned that he had a wife in Austria and filed a claim in her behalf. She came over and the case was heard a few days ago and taken under advisement. The minimum amount she may receive is $1,600 and the maximum $3,500.

Carlinville—Information has been filed with State's Attorney James Murphy against Walter Falcetti, company weigher of the Royal Collieries Co. at Virden, charging him with defrauding miners by giving them short weight. It is charged in the bill that Falcetti was seen with his foot in such a position that it held down a scale rod and resulted in short weight. Falcetti denies that he intended to give short weight.

PERSONALS

J. R. Smith, manager of the Elyton Coal Co., was recently operated on for appendicitis. He is resting well.

James Christopher, superintendent of the Abrams Creek Coal and Coke Co., at Oakmont, W. Va., has resigned his position with that firm.

F. W. Wilson has been appointed engineer of fuel economy for the Chicago, Rock Island & Pacific Ry. Co., with headquarters at Chicago, in place of H. Clewer, promoted.

B. W. McClure, who recently left the service of the Davis Coal and Coke Co., has been appointed superintendent of the Abrams Creek Coal and Coke Co., with headquarters at Oakmont, W. Va.

Julius E. Bierach, sales agent for the St. Bernard Coal Mining Co., at Louisville, has returned to his desk after an absence of a month. He had been somewhat indisposed but is now in vigorous health again.

Reese West, of Millfield, Ohio, who has been mine foreman for the Poston Consolidated Coal Co., Mine No. 7, for several years, has resigned his position to accept a similar one with the Essex Coal Co., of Pomeroy.

Joseph H. White, sanitary engineer for the Bureau of Mines, and author of many articles on mine sanitation and welfare work, has resigned from the Bureau to become superintendent of sanitation, housing and general welfare for the Braden Copper Co., of Rancaqua, Chile.

A. W. Herstine, for some time chief clerk of the Federal Coal and Coke Co., in the Fairmont field, has severed his connection with that corporation to become connected with the Alden Coal Co., of New York. Mr. Herstine will have offices in Fairmont.

W. D. McCausland, who, for the past five years, has been general superintendent of the mining operations of the West Virginia-Pittsburgh Coal Co., in the Panhandle district of the Pittsburgh region, was recently elected assistant general manager, with headquarters at 710 House Bldg., Pittsburgh, Penn.

OBITUARY

John P. Reiss, of the C. Reiss Coal Co., of Sheboygan, Wis., and well known throughout coal and financial circles at New York, Cleveland and Minneapolis, died recently.

C. T. Kratz, member of the Pennsylvania Coal Commission, died suddenly recently of heart failure at his home in Norristown, Penn. Mr. Kratz was nearly 66 years of age.

Martin A. Donnelly, for years identified with the Keystone Coal and Coke Co., died recently from heart failure. Mr. Donnelly was born in Philadelphia in 1876, being therefore 40 years old at the time of his death. He is survived by his wife, mother, one sister and three brothers, all residing in Philadelphia.

James Hillhouse, one of the pioneers of the Birmingham, Ala., district, and a developer of its mineral wealth, died recently at a local infirmary, where he had been since September of last year. Mr. Hillhouse had resided in the Birmingham district since 1884, and had been actively identified with the development of the coal field in the Birmingham district for years. At the time of his death he was president of the North Pratt Coal Co., and a director of the North Birmingham Trust and Savings Bank.

Charles D. Norton, president of the Charles D. Norton Coal Co., of Philadelphia, died suddenly from heart disease in the Hotel Biltmore, New York City, at noon on July 21. Mr. Norton was automobiling from his home in Philadelphia to New London, Conn., when stricken. He was 71 years old. The funeral took place on Tuesday in Philadelphia. After graduating from Harvard University Mr. Norton became a member of his father's firm, Auden, Reid & Norton, later taking charge of the business and changing its name to the Charles D. Norton Coal Co.

INDUSTRIAL NEWS

Harrisburg, Penn.—The Pennsylvania Coal and Coke Corporation has been authorized by the Public Service Commission to increase its bonded indebtedness and will put a big part of this money into increasing its facilities. A new mine will be opened in the vicinity of Amsbry.

Chicago, Ill.—The Sullivan Machinery Co., of Chicago, recently established a new agency in Holland with Messrs. Petrie & Co., Heerengracht 141-145, Amsterdam, as special representatives. This new arrangement replaces the Sullivan Machinery Co. agency, previously established at the Hague.

Louisville, Ky.—The Wallins Creek Coal Co., Edward J. Hackett, manager, is advertising in the Louisville papers for suggestions for a trade name for its coal. "A good, snappy name" is asked for and the winner will be given 100 bu. of the coal he provides the name for. Ten of the leading retailers of the city will handle the fuel.

Wilkes-Barre, Penn.—It is reported that the West End Coal Co., operating mines at Mocanaqua, has sold its interest to a firm of New York capitalists, the selling price being between one and one and a half million dollars. The West End Coal Co. is capitalized at $800,000, on which it has been paying 12 per cent. dividends for several years.

Buffalo, N. Y.—The break in the lock of the Lachine Canal in the St. Lawrence River above Montreal, which has closed that water route for some time, seriously discommoded coal

shippers over the route from Lake Erie ports, but rather relieved shippers from Sodus Point, Lake Ontario, where a sudden shortage of coal has developed.

Pittsburgh, Penn.—The Duquesne Light Co. is constructing a large coal-storage basin on Brunots Island, to prevent the loss by fire of coal kept there for the power plant. The basin will be the only one of its kind in this part of the country, and will hold 10,000 tons of coal, which will be flooded with water to prevent spontaneous combustion.

Philadelphia, Penn.—The experiment is to be tried of sending coal by barge from this part to the West Indies. With this object in view the steel barge "Anna M. McNally" has been chartered to load 300 tons of anthracite coal for Abaco, British West Indies. The trip from here will be made via canals to Beaufort, N. C., where the ocean tow will begin.

Boston, Mass.—The Consolidation Coastwise Co.'s Barge No. 8, loaded with 1,550 tons of coal for this port, was sunk in a collision with the steamer "Comus" off Sea Girt, N. J., on July 21. No lives were lost. The barge was being towed from Baltimore by the tug "Cumberland." This is the fourth barge this company has lost during the past 15 months.

Johnstown, Penn.—A coal deal of unusual importance is that in which J. B. Kennerly, of Philadelphia, took over the Wentz Coal Mining Co.'s plant and equipment near Holsopple. Mr. Kennerly has options on four or five other mines in Cambria, Somerset and Indiana Counties. The Wentz mine will be developed to 1,500 tons daily capacity within one year.

Columbus, Ohio—Royalties amounting to $32,750, plus several thousand dollars' interest, on coal lands in the Hocking Valley, were recently awarded to the New York Coal Co. from the Sunday Creek Coal Co. by Common Pleas Judge Kinkead. The New York Coal Co. had already recovered about $2,000 as its share of the output of the coal lands leased to the Sunday Creek Coal Co.

Charleston, W. Va.—Suit against the Sunday Creek Coal Co. of New Jersey, brought in Common Pleas Court by C. C. Lewis, Sr., and the Chinch-Knight Coal Co., have been compromised and levies against the property of the defendant company have been withdrawn. It is said that the company will at once resume operation in its mines at Shrewsbury, Mammoth and Cedar Grove.

St. Louis, Mo.—Notice has been received here that the Interstate Commerce Commission has granted an application of the Southern Ry. and the Missouri, Kansas & Texas Railway Co. for a rate of $1.50 per net ton on coal from Illinois mines in group 1, on the lines of the Southern, to Monroe, Mo., via East St. Louis, provided that no higher rate is maintained from intermediate points.

St. Louis, Mo.—The first three round trips of the barge "Inco" of the Inland Navigation Co. between St. Louis and New Orleans saved St. Louis shippers $5,000 as compared with railroad rates, according to a report made by the company to Mayor Kiel. The company informed the mayor that it is constructing two more barges and by September will have a weekly service between the two cities.

Philadelphia, Penn.—The Philadelphia & Reading Ry. is gradually regaining its position as the premier shipper of anthracite, which it has yielded a number of times recently to the Lehigh Valley R.R. For the month of June the Reading led in shipments by over 85,000 tons and for the six months of the year the total shipments were 6,322,988 tons, being over a half a million tons in excess of the Lehigh Valley.

Waynesburg, Penn.—W. Harry Brown, of Pittsburgh, recently purchased at sheriff's sale J. W. Seaman's interest in four tracts of coal in Cumberland Township, the price being $25,000, or $250 per acre. This coal is close to other holdings of Mr. Brown and is but a few miles from the development of the Poland Coal Co. on Little Whiteley Creek. Coal in the same neighborhood has sold at from $500 to $800 per acre.

Cincinnati, Ohio—Involuntary bankruptcy proceedings have been brought in the United States District Court here against the Rapp Coal Mining Co., operating mines in West Virginia, by the Marsh Fork Coal Co., of Charleston, W. Va., the Bluefield Coal and Coke Co., Bluefield, W. Va., and the E. E. Beck Lumber Co., Cincinnati. It is charged that the Rapp company is insolvent and has made an assignment for the benefit of creditors.

Philadelphia, Penn.—A gain of 199,126 tons of coke is the outstanding feature of the June report of the amount of coal and coke carried by the Pennsylvania R.R. Fuel shipments, generally including both anthracite and bituminous coal, show healthy increases. Coke shipments totaled 1,189,602 tons, or a gain of more than 10 per cent. Bituminous coal aggregated 2,744,647 tons, a gain of 79,944, with anthracite showing 907,892 tons, an increase of 64,839 tons.

Washington, D. C.—Secretary Lane recently announced the location of two of the three new mining experiment stations recently provided for by Congress. One station will be at Fairbanks, Alaska, and another at Tuscon, Ariz., while the third will be in the Pacific Northwest, at a place to be announced later. Safety stations also to the number of three have been authorized and will be built at Butte, Mont., Reno, Nev., and Raton, New Mex.

Boston, Mass.—In an agreement just reached between the committee representing New England commercial organizations and the New Haven R.R., it is proposed that the New Haven be permitted to extend for another 60 days its extra demurrage charge of $5 per day on freight cars detained, for unloading or loading, four or more days after the expiration of the 48-hr. free time allowance. This extra charge is in addition to the regular charge of $1 per day effective each day after the expiration of the free time.

Hazelton, Penn.—The Temperance mines near here, now owned by the Lehigh Valley Coal Co., are to be operated by the stripping method, the company having just let the contract to a firm of stripping operators. The operation has been idle for over 50 years, being abandoned at that time as worked out, but under the new method of operation it is felt that many thousands of tons of coal will be obtained. Owing to the fact that the maps of the mine were thoughtlessly destroyed 40 years ago the mine is uncharted and an air of mystery has surrounded the operation for that reason.

Charleston, S. C.—The barge "Northwest," out from Philadelphia coal laden, and which with a companion barge "Southwest," broke away from their tow in a storm, has been brought into this port, with the crew of five men in a bad state of collapse. The barges were lost while in the tow of the tug "Wellington" during the recent hurricane. The "Wellington" rescued the 123 men who were aboard the U. S. collier "Hector" wrecked in the same storm. The barge "Southwest" has since been discovered sunk at Bulls Bay, S. C., and the bodies of three of her crew have floated ashore, including Captain Merriam.

Philadelphia, Penn.—Fuel shipments of all kinds via the Pennsylvania R.R. showed good increases during the month of June. The biggest gain was made in coke, with an increase of 199,126 tons. The total tonnage of this fuel was 1,189,602 tons, or a gain of 10 per cent. Bituminous shipments amounted to 3,744,647, a gain of 79,944. Anthracite shipments increased 64,839, with a total tonnage of 907,892 tons. Total fuel shipments for the month amounted to 5,842,141, while for the six months period ending with June 30 the entire shipments were 37,480,971, of which 24,269,137 tons was bituminous coal, the balance being other fuel.

Chicago, Ill.—Considerable interest has been aroused in Kansas City, St. Louis and Chicago by the entrance of Springfield screenings into Kansas City. It is understood that several of the Springfield operators together have taken a contract to supply 1,500 tons daily of Springfield screenings to an electric public service corporation in Kansas City at a price of 85c. per ton at the mines, the Chicago & Alton R.R. having made a rate of $1.25 per ton for the movement from the Springfield district to Kansas City. Formerly the rate was $1.90 per ton. This tonnage will displace Kansas production and some tonnage which has been previously shipped from mines near St. Louis.

Pittsburgh, Penn.—The Dravo Contracting Co. is sinking two 500-ft. concrete lined shafts for a new plant for the Union Collieries Co., on Puckety Creek, about four miles east of North Bessemer, on the Bessemer & Lake Erie R.R. It is also sinking two 200-ft. concrete lined shafts for a new plant of the Bessemer Coal and Coke Co., near Russellton. The 300-ft. concrete-lined shaft which the same company is sinking for the National Mining Co., near National Station on the Montour R.R., is now about 30 ft. from the coal. Extensive concrete arching is planned for the shaft bottom, which will connect with the present underground workings of the National Mining Co., at Sygan and Treveskyn.

Harrisburg, Penn.—The board appointed to examine candidates for mine inspectors in Schuylkill, Northumberland, Dauphin and Columbia counties have announced that nine out of the fifteen candidates passed the examination. It is possible that one or two others may be qualified later. Only one new candidate passed, the successful man being Evan Evans, of Coaldale. All the others who passed are now holding office and at least seven will have no opposition at the polls in November. The successful candidates are M. J. Brennan, Kyran Donahue, A. B. Lamb, P. C. Fenton and Evan Evans, Schuylkill County; James A. O'Donnell, Columbia County; P. J. Friel and B. I. Evans, Columbia County, and Charles J. Price, Dauphin County.

Market Department

General Review

Throughout the East, North, West and Northwest anthracite coal appears to be in fair to good demand. Bituminous is in slightly better demand the country over than a week ago, with prices firm and in some cases slightly higher.

Anthracite—Throughout the New England territory the demand for anthracite is strong. The same is true of New York and Philadelphia, but it appears to be less active throughout the South, North and West. Although certain districts, such as New England, are finding it difficult to move chestnut coal, other localities are demanding this grade, thus evening up the consumption of this size of fuel. Options for delivery late in the fall have been withdrawn and prices have stiffened on spot business.

It has been announced that the operators intend to continue the preparation of buckwheat Nos. 2 and 3, but that prices will be advanced 20c. over last year. Boiler coal will also be made. Many producers of anthracite are behind on their contracts, and some are having to purchase from other parties in order to fill their obligations. The situation in anthracite at Tidewater is much better than last week, and it appears to be the consensus of opinion that a shortage of this fuel will exist during the fall and winter. Shipments have been slow, due to the storms of the past week.

Bituminous—From all over the country reports are received of a comparatively light demand for prompt coal with full and heavy shipments on contract. The general trend of prices is slightly upward, while a greater firmness is noted. Car and labor shortages continue in various fields, particularly West Virginia, western Pennsylvania and eastern Ohio. At the present time these are not serious, but uneasiness is felt concerning the conditions which may exist in several months. Another factor in maintaining the market is the effort of railroads to increase their contract requirements before Oct. 1.

Serious loss through heavy rains and washouts through southern and central West Virginia recently caused a considerable shortage of bituminous coal at Tidewater and Hampton Roads particularly. At present, however, the damage has been repaired and coal trains are again moving with practically their accustomed dispatch. In some localities there appears to be an increased demand for the domestic sizes of bituminous coal, while the steam sizes are notably strong.

Lake Trade—The movement of coal from the territory tributary to the Lake markets is fairly large. Prices are still showing strength, while the car supply is fair. A considerable amount of coal is in storage at Lake ports awaiting shipment, but little except contract tonnage is available. Advanced rates are being paid to obtain prompt dispatch. Considerable difficulty is being experienced in securing tonnage for Lake Michigan ports, since most vessels draw their return cargoes from Lake Superior.

Middle Western—Interest in the market of the upper Mississippi Valley still centers in the steam trade. Domestic buying is somewhat slow, although a greater volume of this coal is being handled now than during the previous week. Several mines, particularly in Illinois, are preparing to reopen, while others are working on contract to the limit of the car supply. Complaint is sometimes heard that the demand from retailers is slow, but the steam sizes particularly are buoyant.

Three-inch Hocking lump made its appearance in the Chicago market recently. A slight quickening is noticed in the domestic coal market of St. Louis and its vicinity. Screenings and steam sizes generally are stiff and are being moved in considerable volume and at comparatively high prices. A depression in the domestic coal market of Kentucky may be explained by a labor shortage. This field is, however, finding difficulty in filling its orders for the steam sizes. The tendency in coke prices for furnace, foundry and domestic grades is somewhat upward.

A Year Ago—Anthracite situation continues discouraging. Bituminous slow and export business erratic, with competition more aggressive. Pittsburgh district firmer due to activity in steel. Full summer dullness prevails in Middle West.

Business Opinions

Boston News Bureau—Definite confirmation of the recent rumors of new war orders is had by the allotment of $15,000,000 and $18,000,000 shell contracts to American Locomotive and American Car & Foundry companies, respectively, and the information that orders for over 1,500,000 large shells have been placed during the past week. In this connection the public statement of Lloyd-George that Great Britain is still in need of shells is of considerable significance. There seems to be little doubt that further munitions orders are headed for the United States for those companies that have demonstrated their ability to handle a large volume. It goes without saying that they will call for immense amounts of copper, spelter and other raw materials, and may be sufficient to break the deadlock that has existed in these lines for weeks. It is expected that the war-order companies will see fit this fall to distribute the profits that have been so long conserved and that actual distribution will excite the enthusiasm that last summer's forecasts aroused.

Iron Age—Surpassing the highest estimates, the Steel Corporation's $81,000,000 earnings in the past quarter, reported on Tuesday, following two remarkable statements of independent steel companies, confirm what the market has lately shown of the exceptional position of the producers of steel. Along with heavy tonnages of unfilled orders, and the large purchases Europe is yet to make in this country, they point to a stronger market in the remainder of the year than was indicated one or two months ago.

The extent to which foreign demand is now making the market is indicated by the fact that out of 170,000 tons booked in the past week by one Chicago interest, less than 12 per cent. was for domestic delivery.

The heat continues to cause an unusual curtailment of output throughout the country—a factor on which more stress is being laid. In the Pittsburgh district the reduction last week is put at 15 to 20 per cent.

Marshall Field & Co.—The current wholesale distribution of dry goods shows a considerable increase over the corresponding period of a year ago. Buyers have attended the market in larger numbers than during the same week in 1915. Attention is being centered on the coming Market Week and Fashion Show, Aug. 7 to 12, and wholesalers are preparing for an influx of merchants. Collections are better than for the corresponding period last year. The market on domestic cotton goods is firm.

Dun—Business continues remarkably full during the period when it ordinarily shows the greatest shrinkage. While in some important lines, notably in steel and leather, foreign demands are again the overshadowing feature, it is not because of any lack of confidence that domestic buying has abated. Many interests here, having already covered their requirements well ahead, naturally proceed more slowly in extending commitments further. To a certain extent, crop uncertainties are a cause for hesitancy, but, on the whole, agriculture progresses favorably, though recent storms in the South have been somewhat detrimental to cotton. Curtailment of industrial operations has occurred in the flooded districts, and manufacturers nearly everywhere are hampered in one way or another, chiefly by the labor shortage and high temperatures.

Bradstreet—Most reports regarding trade, industry, crops and prospects sound highly encouraging, about the only discordant notes being those heard from storm-swept sections of the southeast, where, naturally, trade has been set back pending rehabilitation. But over the larger part of the country, trade, now large, is increasing, and is likely to grow still further, while never before have seasonal influences made for so little recession. Predictions of an inevitable slump in business are rife, yet most measures of economic movements indicate that high-speed momentum is maintained, and just as things seem to be shaping for a setback, fresh stimulating impulses appear. This is particularly true of foreign demand for all kinds of products. Besides those factors, retail trade in summer fabrics is good, mail-order houses are doing more than well, collections are good, and money is in better demand at firmer rates.

ATLANTIC SEABOARD

BOSTON

Washouts seriously affect current supply at Hampton Roads. Prices advance for export coal. Georges Creek shipments still light. Pennsylvania prices fairly firm. Anthracite demand strong.

Bituminous—The floods in West Virginia gave the trade a chance to see how closely the demand for Pocahontas and New River had caught up with the supply. Steamer arrangements were considerably upset for the best part of a week, and few of the shippers were in position to promise quick dispatch. In several cases boats due to load were sent to Philadelphia or Baltimore to take on their cargoes.

Prices f.o.b. are firmer because of the shortage and $3 is again being heard as a possible figure for spot sales in the coastwise market. The export trade is also affected and it would not be surprising to see $3.25 realized within a short time.

Not for many months has the market so nearly approached buoyancy as during the early part of this week. The possibility of some large foreign government orders being placed at Hampton Roads has given further impetus to higher price talk.

A few railroad orders for New England are also in the market, but it is expected they will be closed about in the usual channels; in other words the present contractors will continue to supply. When it is found there is delay at Hampton Roads it is likely that other buyers will come into the market.

The agencies, however, are likely to be shy of duplicating the rigid loading guarantees that have been the rule this season. It is early in the season for detention to begin. There is considerable anxiety over the outlook, especially among steamship owners or charterers who depend on quick handling.

Options for delivery late in the fall are being withdrawn. Meanwhile prices are stiffening on spot business, although no radical advance can be reported. Most factors realize they have their hands full to keep customers supplied.

The Georges Creek situation shows little improvement. A shortage of labor at the mines causes the shippers to fall still farther behind on contracts and the thick weather is retarding the movement of boats. F.o.b. Philadelphia and New York, Georges Creek is available in relatively good volume, but principally because there are so few boats to move it. Practically all is being applied to season contracts. All-rail movement is spasmodic.

The Pennsylvania grades share the general firmness. Operators are conservative over the tonnage they sell and intend to be ready for higher prices later on. Predictions are freely made concerning the drift of the market during the next month or two and already a 15c. premium is paid for October delivery.

The most desirable coals are fast withdrawing from the market, so much business has been taken. A recent inquiry for a supply a year ahead found no response. Coals on which much effort has been expended to introduce them to this territory are now little heard from, output having been placed in other directions.

Rail business is good from all the regions and there is evidence that New England mills are trying to be moderately forehanded. If consumers could feel more confidence in the ability of the railroads to handle coal this winter to points near Tidewater, there would now be an active demand for the all-rail grades from such quarters.

Bituminous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.35@2.85	$2.65@3.15	.....	$1.10@1.60
Cambrias and Somersets	2.60@3.00	2.90@3.30	.....	1.35@1.75
Georges Creek (contract)	3.07@3.17	3.37@3.47	$3.00@3.10	2.00@2.10

Pocahontas and New River, f.o.b. Norfolk and Newport News, Va., are $2.90@3. On cars Providence and Boston prices are $4.85@4.95.

Anthracite—Shipments are disappointingly slow and are expected to continue so. Delays are the rule in every department; the fog and storms of the past week have only aggravated the uneasiness of the dealers.

From time to time one size or another is short at the loading piers, but mostly it is a case of slow movement at sea and slow handling. Broken and egg are in strong demand, while chestnut and pea are in fairly easy supply. The companies are scrutinizing every order these days and for the most part each shipper is looking out only for his regular trade. There is every indication of difficult times ahead for the retailer.

NEW YORK

Anthracite in good demand. Operators to continue making buckwheats Nos. 2 and 3. Bituminous gains strength, and prices rise. Some producers behind on contracts. Tidewater situation much better.

Anthracite—The most interesting development in the anthracite situation this week is the announcement by most of the companies that they will continue to make buckwheats Nos. 2 and 3, but that the new prices will be advanced 20c. a ton over those of last year. At the same time it was said that the operators will continue to make boiler coal, which not a few large users have found more advantageous and economical than the smaller buckwheats, and that the price for this size hereafter will show a reduction of 10c. from that announced in May.

Some surprise was expressed that the tonnage figures for June showed a material increase over those for the same month of last year. It was supposed that less coal had been shipped last month, notwithstanding the fact that the mines were working full time with less help than half time with capacity help a year ago.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports, are as follows:

	Circular	Individual		Circular	Individual
Broken	$4.95	.....	Pea	$3.80	$3.30@3.80
Egg	5.25	$5.25	Buck	2.75	2.50@2.75
Stove	5.45	5.45	Rice	2.45	2.30@2.45
Nut	5.55	5.25@5.55	Barley	1.95	1.75@1.95
			Boiler	2.10	

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The bituminous market continues to gain strength. Demand is heavy and prices are gradually increasing. The majority of mines are working about half-time, but some of them are closed down entirely owing to labor shortage. Another factor in keeping the supply short and prices up is the effort of the railroads to increase their contract requirements between now and Oct. 1.

Some producers are reported running so far behind on their contracts that they are now buying from other producers. At the same time representatives of Eastern houses are touring the coal fields in an effort to place orders. Consumers have already been warned of a possible repetition of last winter's car congestion.

The export situation is improving, while the bunker demand is better.

Current quotations for the various grades, gross tons, f.o.b. New York Tidewater, are as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.50@3.65	$3.50@3.60	$3.50@3.65	$1.95@2.10
Georges Creek Tyson	3.10@3.30	3.10@3.30	3.10@3.30	1.55@1.75
Clearfield: Medium	3.00@3.20	3.00@3.20	.....	1.45@1.65
South Forks	3.30@3.50	.....	.....	1.75@1.95
Nanty Glo	3.10@3.20	.....	.....	1.55@1.65
Somerset County: Medium	3.00@3.10	3.00@3.10	3.00@3.10	1.45@1.55
Quemahoning	.....	3.10@3.25	3.10@3.25	1.55@1.70
West Virginia Fairmont ¾	.....	3.00@3.10	3.00@3.10	1.20@1.30
Fairmont mine run	.....	3.00@3.10	3.00@3.10	1.20@1.30
Western Maryland	.....	2.95@3.00	2.95@3.00	1.40@1.45

PHILADELPHIA

Anthracite displays activity. All sizes moving well except chestnut. Price cutting minimized. Shippers agree busy fall certain. Collections fair. Bituminous shows slight price increase.

Anthracite—A spurt has developed in business the latter part of July, unusual as it may seem. While it is yet possible to buy egg at $3.95, stove at $4.20, nut at $4.30 and pea at $2.60, dealers are availing themselves of the opportunity to place orders before the advance of 10c. per ton becomes operative Aug. 1.

The demand for the prepared sizes is in the same proportion as it has been for the previous weeks of this month, that is, egg is active, with no surplus here, probably because a large tonnage of this size has been going to New England. The stove situation is similar but more pronounced, as the requisitions exceed the production to such a degree that orders for it this week were given by dealers demanding that shipment in July be guaranteed.

Chestnut remains burdensome and is being sold at concessions by individuals, or with promise of an equal proportion of stove for every car of chestnut by the companies. Pea is about to come into its own and it will be a disappointment if this size is not bought heavily in August. In fact it will be poor judgment to further neglect this size and the dealers seem to be beginning to realize this.

The steam coals are quiet this week, as some of the large companies are known to have dumped a small tonnage of buckwheat coal in the storage yards. They state, however.

that this should not be considered as indicating the trend of conditions, as they feel that activity will be maintained in this size for many months to come. Rice, boiler and barley, however, continue exceptionally quiet.

Collections by the big companies are reported in fairly satisfactory shape for mid-summer, although the retailers are almost a unit in saying that they will not see much more money from their customers until coal begins to move in the fall.

The prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.75	Buckwheat	$1.65	$2.55
Egg	3.95	5.05	Rice	1.00	....
Stove	4.20	5.30	Boiler	.90	1.80
Chestnut	4.30	5.35	Barley	.75	....

Bituminous—A few of the better grades of bituminous coal recorded slight increases averaging five cents per ton, due principally to a sudden dearth of cars affecting those particular districts. It is felt that these slight increases are but the precursors of a condition that is bound to extend, with slight variations, into the winter season, as the rail and labor conditions are such as to make it unavoidable.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein	$1.90@2.00	Fairmont gas, ¾	$1.55@1.65
South Fork Miller Vein	1.70@1.80	Fairmont gas, mine-run	1.40@1.50
Clearfield (ordinary)	1.40@1.50	Fairmont gas, slack	1.20@1.25
Somerset (ordinary)	1.35@1.40	Fairmont lump, ordinary	1.35@1.45
West Va. Freeport	1.25@1.30	Fairmont mine-run	1.20@1.30
		Fairmont slack	1.20@1.25

BALTIMORE

Market as a whole shows price strength. Several regions reported short on cars, and mine labor continues scarce. Anthracite conditions dull.

Bituminous—The trade as a whole found the market well sustained as to price quotations. As often happens in a market of that kind the line of demarcation between poor and good coals grew decidedly less distinguishable. There was little fuel offering in any region to the trade at less than $1.25. More and more mines are replying that they are sold up to their present capacity under the scarcity of labor. There has developed a decided car shortage in many regions, and this will undoubtedly play a big part in the present situation. Thus the trade is faced with a stiffening market irrespective of the fact that the demand for coal is but moderate.

Prices to the trade are about as follows, at the mines, per gross ton: Georges Creek, Tyson, $1.75; Miller vein, $1.45; Quemahoning, $1.50; Somerset, $1.40; Freeport, $1.30; Fairmont, gas, three-quarter, $1.25; same, mine-run, $1.20 to $1.25; slack, $1.15.

Anthracite—Dealers here report demand generally light, although showing some little improvement over the previous week. This is apparently due to a desire of some customers to take advantage of next to the last reduction period, as coal will advance here 10c. a ton on Aug. 1 and a like amount on Sept. 1. There is some purchasing of smaller sizes for usual summer use, but this does not cut much of a figure in the trade.

Exports—While charter rates to South America are steady, those to Mediterranean ports are showing new signs of advance. The fact that three Italian sailing ships destined to load here and one Italian steamer from Baltimore to Naples have been torpedoed recently is having its effect. The west coast of Italy calls for a rate of from $27.50@29.16.

HAMPTON ROADS

Serious floods and washouts cause shortage. Tonnage dumped light. Vessels meeting with considerable delay. Export and bunker demand still good. Coastwise shipments improving. Anthracite inactive and bituminous prices stronger.

Delay in the Tidewater movement over the Norfolk & Western and Virginian, due to floods and washouts, has caused a slump in tonnage dumped over the Lamberts Point and Sewall Point piers. Transportation on the Chesapeake & Ohio was not delayed so seriously as on the other two coal-carrying roads, and as a result Newport News tonnage shows no falling off.

Stocks for several days were down to almost nothing, and as yet have not reached normal proportions. At one time the supply was the lightest known for years. On this account vessels have been, and are still, meeting with delay in loading.

Anthracite, along with the other domestic coals, is dull. There will be little activity in the domestic market until cooler weather.

Prices show a stronger tone, being quoted as follows: Pocahontas and New River mine-run, for cargo, $2.85@3 per gross ton; on track, $2.75 per net ton, for bunkers, $3.30 per gross ton, plus trimming charge of 10c. Anthracite is $7.50 per net ton.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	June 24	July 1	July 8	July 15	July 22
Norfolk & Western	171,394	160,108	114,026	173,347	168,108
Chesapeake & Ohio	95,365	70,905	91,311	.....	133,897
Virginian	83,408	94,029	94,016	90,989	73,870
Totals	350,163	325,032	299,353	.....	315,875

Ocean Charters and Freights

VESSEL CLEARANCES

NORFOLK

Vessel	Destination	Tons
Eustace[6]	Buenos Aires	5,361
Evelyn[2]	Havana	4,280
Eric II[2]	Kingston	2,563
Harald[3]	St. Thomas	4,606
Negus[6]	Curacao	4,022
Hugo[6]	Kingston	2,178
Pietro[16]	Genoa	4,832
Doonholm[10]	Genoa'	2,264
Silvia[16]	Bagnoli	5,026
Mary Olsen[2]	Porto Rico	918
Erminie[6]	St. Georges	565
Oakley C. Curtis[2]	Lisbon	3,188
Achilles[1]	Cristobal	12,034
Admiral Sebree[17]	Callao	498
Wilberforce[2]	Montevideo	4,307
Nicolo[16]	Porto Ferrajo	4,467
Loch Tay[16]	Genoa	6,844
Albert H. Willis[5]	St. Michaels	843
A. B. Sherman[5]	Horta, Fayal	861
Muskegon[5]	Buenos Aires	4,617
Juno[11]	Italy (any port)	3,765

BALTIMORE

Vessel	Destination	Tons
Apollo	Rio Janeiro	1,755
Hackensack	Peru	5,701
Tupy	Santos	2,888
Claveresk	Felton, Cuba	6,100
Ronald	Chile	6,090
Georgios	Leghorn	4,236

BALTIMORE

Vessel	Destination	Tons
Brode	Norway	3,512
Graafaxe	Havana	1,871

NEWPORT NEWS

Vessel	Destination	Tons
Californian[4]	Rio Janeiro	7,563
Chiswick[4]	Havana	4,798
Valdura[8]	Buenos Aires	7,466
Munalbro[4]	Havana	6,639
Nereus[18]	Italy (any port)	5,396
Admiral Clark[4]	Havana	2,510
Billswood[4]	Montevideo	5,016
Wellington[18]	Dakar, F.W.A	8,438
Oldfield Grange[4]	Havana	7,540
Moldegaard[4]	Antilla	4,054
Arborean[4]	Valparaiso	8,433
Snig[14]	Montevideo	3,299
Santa Clara[4]	Rio Janeiro	6,750

PHILADELPHIA

Vessel	Destination	Tons
Narvik	Gothenburg	
Manzanillo[4]	Havana	
R. R. Douglass	Charlottetown, P.E.I.	
Carrie E. Look	Halifax	457
Palatka	Ponce, P. R.	367
George S. Smith	Manzanilla	495
Henry Tegner	Guantanamo	
Lodaner	Havana	
Thelma	Ivigtut	
Atlantic[4]	Marseilles	
Antoinette	Progresso	
San Antonio	Havana	

[1] Atwater & Co.
[2] Baker Whiteley
[3] Barber & Co.
[4] Berwind-White
[5] C. G. Blake Co.
[6] Castner, Cur. & Bul.
[8] Ches. & O. C. & C. Co.
[9] Crozer-Pocahontas Co.
[10] Dexter & Carpenter
[11] Flat Top Fuel Co.
[12] Hasler Brothers
[13] Houston Coal Co.
[14] Maryland C. & C. Co.
[16] New River Coal Co.
[16] Pocahontas Fuel Co.
[17] Smokeless Fuel Co.
[18] C. H. Sprague & Son
[19] White Oak Coal Co.
[20] Northern Coal Co.
[21] W. Virginia Coal Co.

OCEAN CHARTERS

Coal freight charters have been reported as follows:

ATLANTIC RANGE

Vessel	Destination	Tons	Rate
Trehawke	River Plate	2,680	$15.20[4]
Glenrazen	River Plate	2,561	15.50[5]
Ryde	Rosario	2,288	16.40[5]
Muskegon	River Plate	2,127	18.85[2 5]
Noruanna	W. Coast Italy	1,660	28.00[4]

VIRGINIA

Vessel	Destination	Tons	Rate
C. A. Campbell	Azores	1,493	$13.00[1 2]
Apollo	River Plate		16.00[1]
Edward E. Briry	Lisbon	1,408	14.00[1]
Henry O. Barrett	Lisbon	1,564	14.00[1]
Manga Reva	Rio Janeiro		[3]

BALTIMORE

Vessel	Destination	Tons	Rate
Sangstad	Hondura	1,459	[1]
Giovanni	W. Coast Italy	448	[1]
Albanese	Bahia		$15.50[1]
Bris	Skinfaxe, Dan. Port Limon	964	
Trehawke, Br.	River Plate	2,680	15.20
Glenrazen, Br.	River Plate	2,561	15.60
Brode, Nor.	Aalesund, Norway		31.80
Normania, Dan.	West Coast Italy	1,660	27.00
Muskegon	River Plate	2,127	18.75
Ryde, Br.	Rosario	2,288	16.45
Apollo, Nor.	Rio Janeiro	1,100	16.00

PHILADELPHIA

Kenwood	Bahia		$15.00

[1] Prompt. [2] At or about. [3] Private terms. [4] July-August. [5] August.

OCEAN FREIGHTS

Freight conditions are much the same as a week ago, and although we have chartered a number of steamers for export coal during this period, none of these fixtures has been reported. We quote freight rates on coal by steamer as follows:

West Coast of Italy	$27.95 about	Cienfuegos	$5.00@5.25
Marseilles	26.75 about	Port au Spain, Trinidad	5.75 about
Barcelona***	23.09 about	St. Lucia	5.75 about
Montevideo	18.25 about	St. Thomas	5.25 about
Buenos Aires or La Plata	18.25 about	Barbados	5.75 about
Rosario	19.45 about	Kingston	5.00@5.50
Rio Janeiro[4]	16.75 about	Curacao[3]	5.00 about
Santos[4]	17.25 about	Santiago	5.00@5.50
Chile[1] (good port)	11.00 about	Guantanamo	5.00@5.50
Havana	3.80 about	Bermuda	4.25@4.50
Cardenas or Sagua	5.00 about	Vera Cruz	5.00@5.50
		Tampico	5.00@5.50

* Consignees paying dockage dues. ** Spanish dues for account of cargo.

[1] 500 tors discharge. [2] 400 tons discharge. [3] And p.c. [4] Net, 1,000 tons discharge. [5] Or other good Spanish port.

Note. Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Market fairly strong with light prompt demand and heavy contract shipments. Occasional seaboard demand for high-grade coal.

The coal market is maintaining a fair degree of strength since the general resumption of mining, there having been no recessions in prices other than those that occurred at the moment. Shipments are heavy to regular contract consumers and the Lake movement is also fairly large.

There is but little demand for prompt coal, but prices are fairly well held. Occasionally some business is done for seaboard when a particularly good grade is desired, and prices above the current market are sometimes realized.

There is a surplus of slack, due to the Lake shipments of ¾-in., but it is not being pressed upon the market to any extent, operators having seen last winter what good prices could be realized then, so that slack is now being stocked if otherwise it would have to be sacrificed.

The season circular price remains at $1.50 for mine-run, but practically nothing is being done in this direction. We quote prompt as follows: Slack, 80@90c.; mine-run, $1.30@1.40; ¾-in., $1.40@1.50; 1¼-in., $1.50@1.60, per net ton at mine, Pittsburgh district.

BUFFALO

Very dull anthracite trade, especially by rail. Bituminous growing scarcer. Mining slow everywhere. Free coal scarce. Fear for winter situation.

Bituminous—The shipper who has "free coal" in any amount over and above the quantity contracted feels that he is fortunate. The shippers, both operators and jobbers, who have contracted more than they can well supply are quite numerous. If they find it hard to get coal enough now to meet their obligations, what will they do in late fall and winter, when cars are scarce and the demand is increased?

It is agreed that the winter situation is sure to be grave, unless there is a letting up of demand on account of the end of the war. Such an event will change the whole course of business and quite likely reduce the demand for not only bituminous coal, but a good many other things. Yet the selling short risk has been taken quite often. Already the difficulty is common, especially with everything but mine run, which is also cut into more or less by the scarcity of slack.

There are no changes in the general situation, but prices are strong for all but mine-run, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.95	$2.75	$2.80
Three-quarter	2.85	2.60	.....
Mine run	2.75	2.50	2.60
Slack	2.40	2.30	2.60

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—Some improvement of the demand in Canada is reported, but in general the coal is mostly shipped to agents or repositories, to be piled up for the fall and winter trade. The apprehension of more demand later on than can be met exists. The shippers can do nothing. With less coal than a normal amount coming out of the mines and still less being sold the situation is far from satisfactory. The independent operator is still enjoying the prospect of a big winter trade at a liberal premium.

Shipments by Lake for the week were 81,845 net tons, cleared as follows: 31,300 tons for Duluth and Superior, 21,500 tons for Milwaukee, 7,800 tons for Waukegan, 3,800 tons for Port Arthur, 2,600 tons each for Fort William, Ashland and Green Bay, 1,715 tons for Hancock, 1,500 tons for Kenosha, 1,100 tons for Sault, Mich., and 330 tons for Gore Bay.

TORONTO

Anthracite in good demand. Bituminous quiet. Yards well stocked. Labor situation has steadying effect on market.

There is a steady demand for anthracite from consumers who are stocking up in advance for fall and winter requirements with the idea that higher prices will shortly prevail. Bituminous is quieter, as manufacturers generally have sufficient supplies on hand.

Current quotations for best grades per short ton are as follows: Retail, anthracite, egg, stove and nut, $8; grate, $7.75; pea, $6.75; bituminous, steam, $5.25; screenings, $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, $4; screenings, $3.25; Pennsylvania smokeless lump, $4.50; Pocahontas lump, $5.50; slack, $3.75.

CLEVELAND

Single orders scarce. Prices still showing strength. Car supply fair.

Single orders for both domestic and steam coal are scarce. Practically all the coal coming into Cleveland is being used on contract business. This applies especially on coarse coal. The slack market is the only redeeming feature and the price on this grade continues to hold firm.

There is a better out-of-town demand for slack coal than heretofore, as practically all steel mills that run 24 hr. per day use this grade. There are also two or three railroads which draw part of their fuel supply from Ohio mines, using fine coal on stoker engines.

Anthracite salesmen all report good sales as the hard-coal buyers are just beginning to realize that they will not get their full requirements this year.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack		Three-quarter	Mine-run	Slack
No. 8	$2.10	$2.00	$1.85	Youghiogheny	$2.60	$2.50	.....
Cambridge	2.10	2.00	1.80	Pittsburgh	2.60	2.50	.....
Middle Dist.	2.00	1.90	1.70	Pocahontas	....	2.70	....
Hocking	....	....	1.70	Fairmont	2.10	2.00	$1.80

DETROIT

Demand for steam coal is not very active. Domestic stock and anthracite are sluggish. Lake shippers find vessels few.

Bituminous—Slackening industrial activity because of continued hot weather is reflected in the lessened volume of business in the steam-coal trade. The buying is chiefly centered around nut, pea and slack at 90c. f.o.b. mine, with some mine-run being sold at $1.15 to $1.20. Orders are few in the domestic trade. Retail dealers continue indifferent. There is just about enough coal on tracks to meet current requirements and sales at prices below regular quotations are few.

Anthracite—Consumers of anthracite are not placing orders worthy of mention and the retail dealers also delay entering the market, disregarding warnings that delivery may be uncertain when the rush to buy sets in.

Lake Trade—Offers of 40c. on coal from Lake Erie to Duluth and 75c. from Lake Erie to fast unloading docks on Lake Michigan were made during the week by coal shippers, without a great deal of vessel capacity being obtained. Even higher rates are available for small carriers on cargoes that are to be delivered at some of the smaller ports on Lake Michigan. Distribution of coal at Duluth and Superior is reported proceeding in unusual volume. Rail shipments from docks at those ports up to July 1 are given as 1,386,555 tons greater than to the similar date last year. Shipments in June were 544,075 tons, or 143,785 tons more than in June, 1915.

COLUMBUS

Trade shows more strength, especially in domestic lines, with prices well maintained. Car shortage is increasing. Ohio mobilization causes labor shortage.

The volume of business with dealers is gradually growing larger as the stocking season advances. While some delay is reported in certain sections, dealers are buying more liberally than usual. The other branches of the trade also show considerable activity, with a consequent satisfactory tone. Prospects for the future are bright.

Retail prices are firm at the levels which have been maintained for some time, and higher prices are looked for in August. There is a good demand for Pocahontas and West Virginia grades, such as Red Ash and White Ash. Anthracite is in fair demand at firm quotations. Stocks in the hands of retailers are not large. Rural dealers are buying better for the threshing season.

The Lake trade is still active, with no signs of cessation. The dock situation at the ports of the Northwest is satisfactory, as the movement to the interior is good. Boats are rather plentiful, although shortages have been reported at various ports. All of the Ohio fields, with the exception of Jackson and Crooksville, are contributing to the Lake tonnage. Lake prices continue firm.

The steam business is good, and prices are ruling firm at the levels which have prevailed for several weeks. Strength is apparent especially in mine-run and the small sizes. There is a good demand for ¾-in., Only a few contracts have not been closed. The car shortage, which is the worst in eastern Ohio, is interfering with steam shipments as well as with the Lake trade. Some shortage is reported on the Toledo & Ohio Central. West Virginia roads are also short of equipment.

Prices per short ton, f.o.b. mines, are as follows:

	Hocking	Pomeroy	East Ohio		Hocking	Pomeroy	East Ohio
Re-screened lump	$1.60	$1.70	.....	Egg	$1.30	$1.35	....
Inch and a quarter	1.50	1.50	$1.40	Mine-run	1.15	1.20	$1.15
Three-quarter-inch	1.35	1.35	1.35	Nut, pea and slack	.80	.80	.80
Nut	1.25	1.25	1.25	Coarse slack	.70	.70	.70

CINCINNATI

Active demand and generally improved conditions. Both domestic and steam grades are moving well, with rising prices.

There has been no decline in the active demand for fuel during the past week, the general tendency being rather in the other direction. With little prospect of appreciable improvement in either the car or the labor supply, the market will have the support of these two factors for an indefinite period, while a heavy demand for all grades of fuel is in evidence, sufficient in itself to hold the market in steadiness. The strength of the steam market may be seen from the fact that the better grades of bituminous nut and slack are selling around $1 per ton of 2,000 lb., f.o.b. mines, and the domestic demand is steadily increasing in volume, as retailers continue stocking for the coming fall and winter season.

LOUISVILLE

Depression in the domestic coal market in Kentucky field. Explained by labor shortage. Difficulties in filling orders for resulting sizes.

Reports from all parts of the Kentucky coal fields are to the effect that although retailers are buying domestic sizes with considerable freedom, there are no deliveries being made on account of continued lack of labor to unload the cars.

Demand for the industrial sizes continues brisk and there is a good deal of difficulty in filling these orders.

Prices are without change.

COKE

CONNELLSVILLE

Spot furnace coke scarce, but demand light. Production approaching former rate. Foundry coke demand light.

There is still a mild scarcity of furnace coke, as production has not altogether attained the rate prevailing prior to this month, while consumption is at substantially the same rate. There has been no scarcity sufficient to bring consumers into the market for spot coke to any extent, but jobbers have been picking up coke right along to apply on their contracts, and as they are paying more for the spot coke than their contract prices, it is evident that coke is somewhat scarce. The total turnover is far from large.

Ella furnace at West Middlesex is out of blast for six weeks or more, on account of an accident, but Struthers is about to blow in, and that will balance.

There is some extra coke in the situation this week on account of the completion of a contract made with one of the steel companies when its own coke production was curtailed by the Pittsburgh district coal-miners' strike. Coke production is gradually increasing as the men become accustomed to the hot weather.

There are no negotiations on furnace-coke contracts, all the business having already been done except in the case of two or three interests who are buying for short periods instead of contracting for the half year. Foundry coke is in poor demand and spot is a shade easier. We quote: Prompt furnace, $2.65@2.75; contract, nominal, $2.35@2.50; prompt foundry, $3@3.25; contract, $3.25@3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ending July 15 at 418,016 tons, an increase of 58,486 tons, and shipments at 417,247 tons, an increase of 54,555 tons.

Buffalo—The coke market is much stronger than for some time, as cars are scarce and men are hard to get at the ovens. The consumption keeps up well and a shortage of cars, such as is looked for in the fall, is likely to stiffen prices still further. Shippers quote best 72-hr. Connellsville foundry at $5.10, 48-hr. furnace at $4.60, high-sulphur at $3.85 and stock coke at $3.60.

Chicago—Tendencies are for higher prices for domestic coke sizes, the ovens being unable to satisfy demands. Foundry coke is being contracted for the second half of the year at higher figures. Prices per net ton of 2,000 lb., f.o.b. cars Chicago, are as follows:

Connellsville	$6.00@6.25
Wise County	6.00@6.25
By-product foundry	6.00@6.25
By-product domestic	4.95@5.30
Gas house	4.50@4.75

St. Louis—There has been a considerable improvement in the demand for coke from the country. Locally business has been dull on domestic sizes, about the only thing that is moving is on contract. This is natural as coke always has been a late mover in St. Louis. The demand for metallurgical coke is strong and steady. Prices remain the same, ranging from about $4.50 on domestic byproduct stove and chestnut, $4.75 on egg and $5.25 on foundry, down to $4.25 on gashouse coke.

MIDDLE WESTERN

GENERAL REVIEW

Interest still centers in steam trade. Domestic buying backward. Smokeless mine run stronger. Anthracite buying fair.

The market situation shows vigor in all quarters, with a firm undertone prevailing. Buying of domestic grades for stocking purposes is still slow, but all steam grades maintain a firm position. Indications point to better movement of Eastern coals from the docks. Industrial buying of steam sizes has been somewhat heavier this week, with prices for screenings well around the dollar mark. The coöperative measures adopted this year by the Indiana and Illinois operators are bearing fruit, so that schedule prices show no modifications or concessions. Cut-throat competition has been removed, and retailers and others who are delaying the storage of coal will undoubtedly pay heavy penalties later for their temporizing.

A few car shortages have been reported this week, with Western mines working between 50 and 60 per cent. and as better operating time is made, curtailment of labor supply is revealed.

Fine coal is running counter to its accustomed course this summer. About this time of year it is usual for screenings to show a break, but with the advent of hot weather no weakness is indicated in fine coal, and prophesies are made that screenings will continue to sell all summer near the dollar mark, owing to the strong industrial demand.

Country buying has shown an improvement this week, but is still behind normal proportions for this time of year. Retailers are under the handicap of being unable to obtain sufficient labor to handle coal, which curtails absorption of storage tonnage at this season and has resulted in demurrage on account of delayed unloading.

The outlook for enlarging sales by southern Illinois operators in Northwestern territory is bright. Shippers report that Northwestern dealers are making increased inquiries and placing additional orders with southern Illinois mines, owing to high dock prices and lack of vessel tonnage.

Smokeless mine run has stiffened at Western selling centers, with the major grades being sold at full circular prices. Prepared smokeless sizes are rather irregular, but excess shipments are evidently withheld from this territory. Domestic Illinois sizes are held on colliery sidings, and offerings of free coal at concessions are infrequent.

So strong is the opinion that late summer and early fall will see a rush of orders with transportation facilities and labor supply insufficient to meet requirements that a number of shippers are refusing to commit themselves to any additional tonnage under contracts. In some quarters it is felt that free tonnage later will yield prices much in excess of those now in effect.

CHICAGO

Demand from retailers slow. Steam sizes buoyant. Smokeless mine run strong. Anthracite dull.

The running time of the southern Illinois field is somewhat above the average for this time of year. Domestic orders for Franklin County coal are increasing, and larger quantities are moving under contract. The demand from the South for Williamson County coal is strong.

All steam sizes are in active demand, and screenings are slightly stronger than last week. Saline County mines are producing mostly steam coal, shipments of domestic sizes being of no consequence. Carterville mines operated this week about 40 per cent. of capacity.

Springfield mines operated about four days this week, with a slightly better call for domestic sizes. Steam shipments show no decline in volume, screenings averaging near the dollar mark.

Shipments of Indiana coal to industrial centers of that state and to Chicago for steam purposes are unusually heavy. Domestic ordering is on a fair basis. No change in prices has occurred except that screenings are slightly stronger.

Orders for smokeless mine run are in excess of the supply, and shipments to this center are scarce because of lack of labor and cars at the mines. Mine run has been steadily absorbed this week at $1.35 both from Pennsylvania and West Virginia, while the lump and egg demand is rather flat, although few orders have been accepted at less than $2.

Three-inch Hocking lump made its first appearance in this market recently, and is being actively sold at $1.60. Splint demand is soft, while eastern Kentucky coal has shown some betterment. The demand for Kentucky sizes is mostly in box cars, but prices still show a wide variation.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars mines:

	Williamson and Franklin Co.	Springfield	Carterville	Clinton	Knox and Greene Cos.
Lump	$1.55@1.65	$1.50@1.60	$1.55@1.65	$1.50@1.65	$1.50@1.60
Steam lump	1.45@1.50	1.30@1.35	....	1.30@1.35	1.30@1.35
2½ and 3-in. lump	....	....	....	1.45@1.50	1.45
1¼-in. lump				1.35	
Egg	1.55@1.65	1.25	1.50@1.65	1.50	1.50
Nut	1.55@1.65	1.25	....	1.35@1.50	1.25@1.35
No. 1 washed	1.65	....	1.60@1.70	....	....
No. 2 washed	1.50@1.55	....	.90@1.00	....	....
No. 1 nut	1.50@1.55	....	....	....	....
No. 2 nut	1.45		....		....
Mine-run	1.25	1.15@1.25	....	1.15@1.25	1.15
Screenings	95@1.05	95@1.00	....	90@.95	.95@1.00

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.55@1.65	$1.50@1.75	1.70@2.00	$1.60@1.75	$1.70@1.75
1¼-in. lump	1.45@1.50	....	....	....	1.60
Egg	1.55@1.65	1.25@1.60	1.70@2.00	1.50@1.70	1.50@1.60
Nut	1.50@1.55	1.10@1.30	1.50@1.60	1.25@1.50	....
No. 1 nut	1.50@1.55	....	....	....	....
No. 2 nut	1.45	....	....	....	....
Mine-run	1.25	1.05@1.25	1.25@1.35	1.20@1.25	1.25
Screenings	95@1.00	.85@.95	....	....	....

Kanawha splint lump, $1.50@1.60.

ST. LOUIS

A slight quickening in the buying of domestic coal is noticed as the month draws to a close.

While the month has been slower than has been expected on domestic coal up to date, it is now showing an improvement since domestic orders are beginning to come quite freely, as another general advance in prices is announced for the first of August. This is usual, and is merely producing the month's end spurt.

Steam sizes in general are holding up remarkably well. Screenings are stiff and are at top-notch prices, and have been scarcer during the recent past than at any time during the summer.

A good strong industrial demand together with the fact that the operators are keeping the situation well in hand is making the outlook on steam coal considerably more satisfactory this summer than it has been in former years. Standard mines are doing well, those that are running are averaging well for this time of the year. There are still some large properties which have been closed down for this season that have not as yet opened up.

There has been quite a spurt in the demand for anthracite, especially in chestnut, from the country in the last few days.

The St. Louis market is quotable on the following basis per net ton, f.o.b. mines:

	Franklin County	William-son	Staunton and Mont-gomery	Inter-mediate	Stand-ard
6-in. lump	$1.65	$1.35@1.55	$1.25	$1.25	$1.00@1.15
6x3-in. egg	1.65	1.35@1.55	1.25	1.25	1.00@1.15
3x2-in. nut	1.65	1.35@1.55	1.25	1.25	1.00@1.15
No. 2 nut	1.50	1.15	1.00	1.00	.90
No. 3 nut	1.35	.....	.....	.....	.....
No. 4 nut	1.30	.....	.....	.....	.....
No. 5 nut	.75	.....	.....	.....	.....
Screenings	1.00	.85	.90	.85	.85
2-in. lump	.....	.....	1.15	1.10	.90
Steam egg	.....	.....	1.15	1.00	.90@.95
Mine-run	1.25	1.10	1.10	1.00	.90
Washed	.....	.....	.....	.....	.....
No. 1 nut	.....	1.65	1.50	1.50	1.40
No. 2 nut	.....	1.50	1.30	1.30	1.25
No. 3 nut	.....	1.35	1.25	1.25	1.20
No. 4 pea	.....	1.25	1.25	1.25	1.20
No. 5 slack	.....	.70	.70	.70	.70

KANSAS CITY

Prices on all grades of coal are firm with some sizes in active demand. Deliveries are slow and a car shortage is in prospect.

Prices on all grades of coal in the district of Kansas, Arkansas and Missouri are firm. There is a great shortage of lump and nut coal, especially nut coal, and to make matters worse, a heavy demand for this grade for threshing purposes. Part of the shortage was caused by delay in shipments due to car shortage.

The demand for screenings is heavy and the prices are firm with no indication of change. All grades are two and three weeks slow on account of the demand being in excess of the supply.

It is the general advice in the district that dealers should order soon to get the advantage of the early delivery. There will be a greater shortage of coal as a result of the shortage of cars in the Eastern fields.

Dealers are being advised especially to stock up with Arkansas semianthracite lump coal as the demand is increasing. In the northern Missouri field there is a good demand with firm prices on all grades.

PRODUCTION AND TRANSPORTATION STATISTICS

NORFOLK & WESTERN

The following is a statement of coal tonnage handled by the Norfolk & Western Ry. for the month of June, 1916:

From	Short Tons
Pocahontas field	1,616,174
Tug River district	348,785
Thacker district	266,362
Kenova district	78,988
Clinch Valley district	121,801
Other N. & W. territory	4,178
Total N. & W. fields	2,436,288
Williamson & Pond Creek R.R.	112,381
Tug River & Kentucky R.R.	44,586
All other railroads	452,395
Grand total	3,045,650

PENNSYLVANIA R.R.

The tonnage of coal and coke carried on the Pennsylvania Railroad Co.'s Lines East of Pittsburgh and Erie for the month and period ended June 30, 1916, was as follows, in short tons:

	June, 1916	Increase	January 1 to June 30, 1916	Increase
Anthracite	907,892	64,839	5,860,041	436,574
Bituminous	3,744,647	79,944	24,269,137	4,007,360
Coke	1,189,602	199,126	7,351,793	2,352,874
Total	5,842,141	343,909	37,480,971	6,796,808

SOUTHWESTERN COAL PRODUCTION

The following is the comparative statement of the Southwestern Interstate Coal Operators' Association for the months of March, April and May in 1915 and 1916:

MARCH

	1915	1916	Increase or Decrease
Missouri	271,374	246,328	—25,046
Kansas	522,242	568,829	+46,587
Arkansas	90,252	84,602	—5,650
Oklahoma	243,505	155,999	—87,506
	1,127,373	1,055,758	—76,615

APRIL

	1915	1916	Increase or Decrease
Missouri	196,032	186,685	—9,347
Kansas	410,565	505,778	+95,213
Arkansas	80,118	84,559	+4,441
Oklahoma	181,873	176,205	—5,668
	868,588	953,227	+84,639

MAY

	1915	1916	Increase
Missouri	161,575	220,381	58,806
Kansas	354,264	495,420	141,156
Arkansas	71,023	105,778	34,755
Oklahoma	173,821	200,367	26,546
	760,683	1,021,946	261,263

This statement only covers the tonnage of members of the association, which is estimated to be about 95 per cent. of the tonnage produced in the four states.

INDIANA AND ILLINOIS SHIPMENTS

The bituminous coal moved by 17 leading coal carriers from Illinois and Indiana mines during the year April, 1915, to March, 1916, inclusive, was as follows:

Illinois Central	9,063,352	Southern Ry.	1,590,960
C. & E. I.	7,393,858	B. O. S. & W.	893,979
C. B. & Q.	6,513,668	St. L. T. & E.	716,549
C. C. C. & St. L.	5,805,149	St. L. & O. F.	730,599
Vandalia Ry.	5,388,970	L. & N.	503,148
C. T. H. & S. E. Ry.	3,612,301	C. I. & L.	784,454
C. & A. Ry.	2,426,789	C. M. & St. P.	534,553
Wabash R.R.	1,745,864	C. & N. W.	508,477
St. L. I. M. & S.	1,674,662		

FOREIGN MARKETS

GREAT BRITAIN

July 5—The firmer tendency shown lately has become still more pronounced. Quotations are approximately:

Best Welsh steam	Nominal	Seconds	$11.19@11.65
Best seconds	Nominal	Best Cardiff smalls	7.05@7.28
Seconds	$11.90@12.13	Cargo smalls	4.86@5.83
Best dry	9.72@12.13		

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freight—Chartering is quiet, with rates about as follows:

Gibraltar	$8.50	Port Said	$21.75
Marseilles	17.00	Las Palmas	9.72
Genoa	18.00	St. Vincent	10.30
Naples	18.00	River Plate	9.72
Alexandria	22.30		